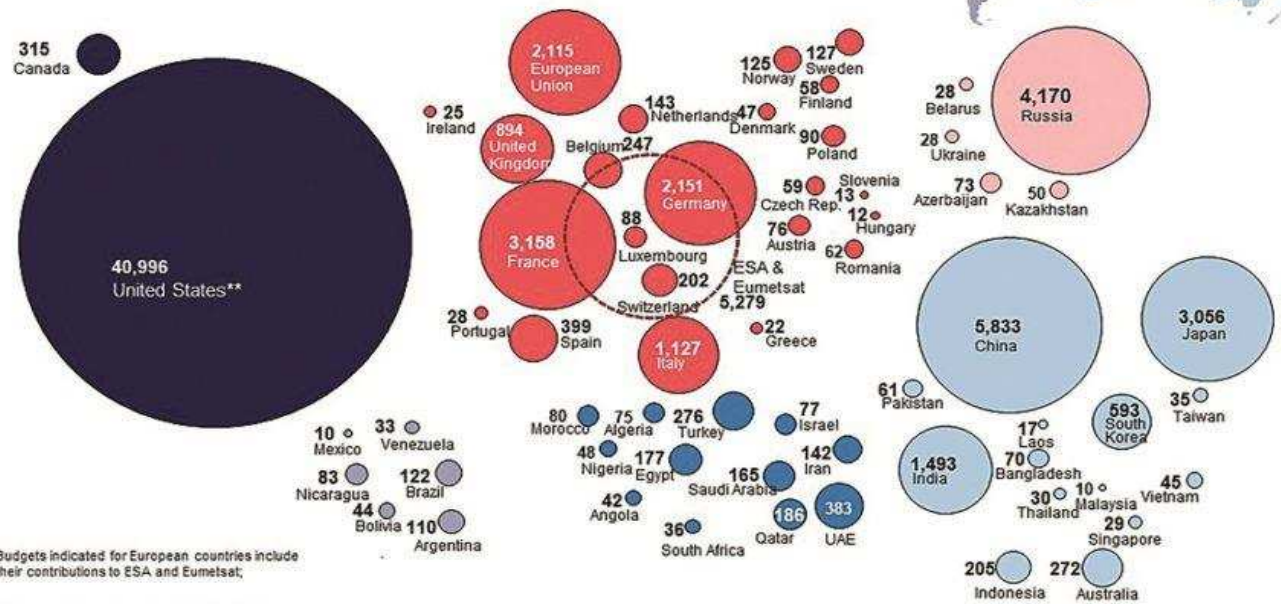


INTERNATIONAL SPACE ORGANISATIONS

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WORLD GOVERNMENT EXPENDITURES FOR SPACE PROGRAMS (2018)* TOTAL \$70.8 BILLION



Budgets indicated for European countries include their contributions to ESA and Eumetsat;

* Only countries with a budget of at least \$10 million appear on the map.

** The United States is undersized (80%)

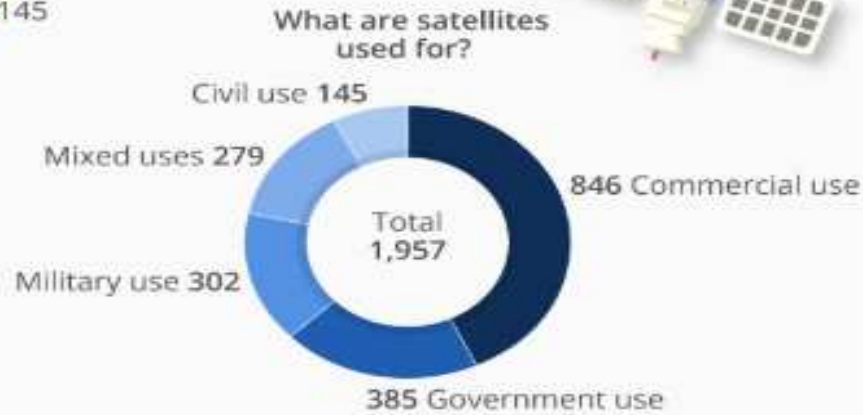
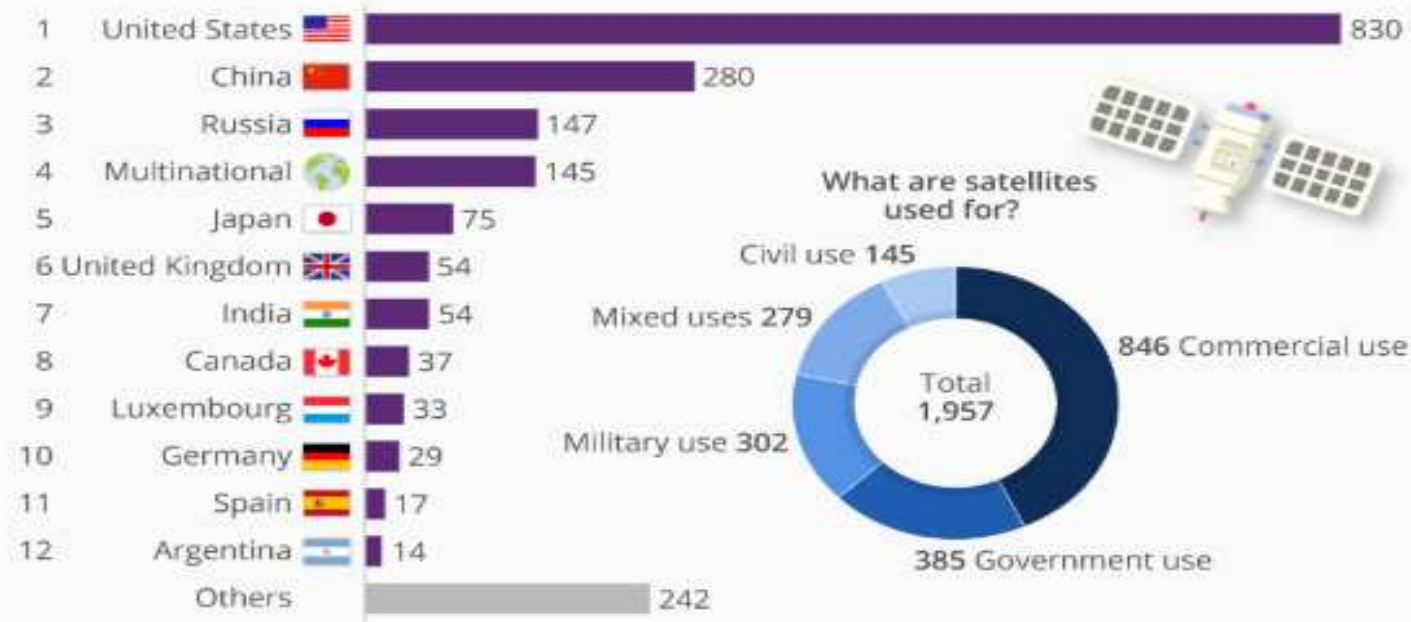
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PROFILES OF GOVERNMENT SPACE PROGRAMS
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THE GROWING NUMBER OF COUNTRIES INVESTING IN SPACE INDICATES THAT GOVERNMENTS RECOGNIZE THAT SPACE ASSETS BRING SOCIO-ECONOMIC BENEFITS TO A COUNTRY.

The Countries With the Most Satellites in Space

Satellites currently orbiting Earth by country* (as of Nov 2018)



* Country of operator/owner

Source: Union of Concerned Scientist Satellite Database

statista

SATELLITES OWNED BY COMPANIES HEAVILY OUTNUMBER THOSE USED BY THE MILITARY, WHICH REFLECTS A GROWING TREND OF THE PRIVATE SECTOR BECOMING MORE INVOLVED IN SPACE TECHNOLOGY.

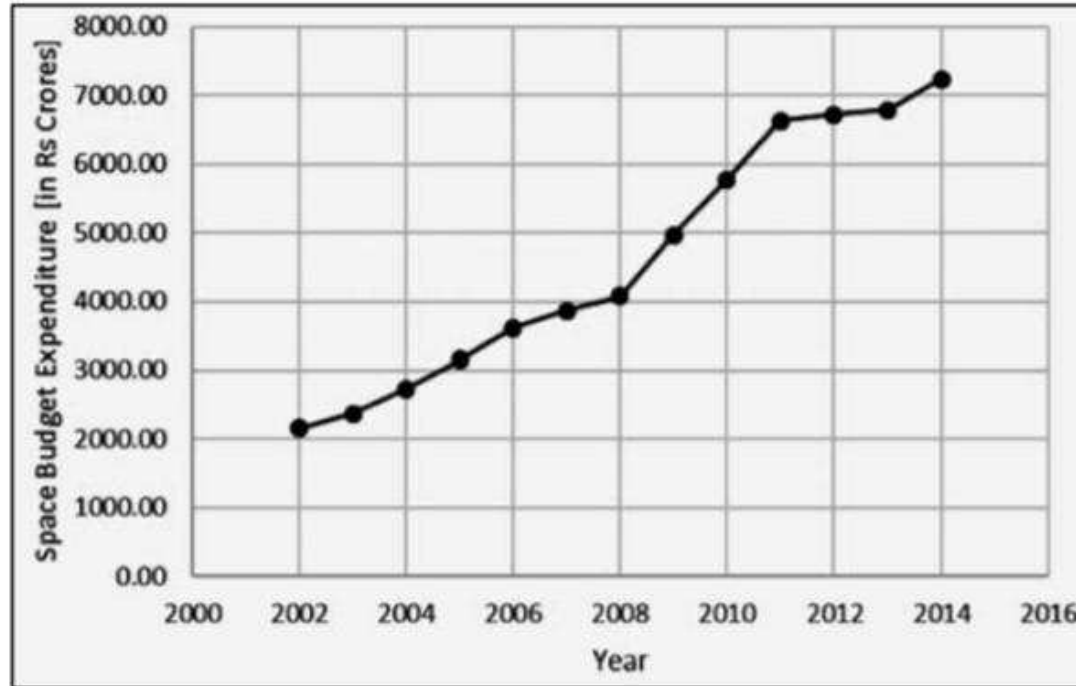


Figure 1 - Evolution of India's Space Budget¹

GROWTH IN INDIA'S SPACE SECTOR

India's private sector is scaling new heights. The Indian space economy is valued at USD 7 billion, which is around 2% of the global space economy. The Indian space sector needs to grow at ~approximately 48% CAGR over the next five years to reach its target of USD 50 billion. The trajectory of growth from 2002-2014 saw an increase of INR 5000 crores.

Source: PWC report

UNLOCKING THE PRIVATE SPACE SECTOR

Trends:

- ▶ Innovation, technology and increasing demand for space based applications and services.
- ▶ Decrease in launch costs and rise in ambition (internet through space or space tourism)
- ▶ Need for funding – lack of investments for R&D. For instance, private enterprises are interested to reach asteroids.

Legal and Policy challenges:

- ▶ Lack of national legislation in India – access to data, national security, liability and responsibility, compliance and CSR to name a few.
- ▶ Lack of established policy/regulatory framework and guidelines for technology commercialization



LOOK BACK TO LOOK AHEAD

**THE SPACE MARKET IS OPEN TO BUSINESS –
ROLE OF INTERNATIONAL ORGANISATIONS
IN SHAPING SPACE LAW?**

- ▶ United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) – a Committee of the UN General Assembly.
- ▶ International Civil Aviation Organisation (ICAO for CNS/ATM)
- ▶ International Meteorological Organisation (IMO for weather satellites)
- ▶ International Telecommunications Union (ITU for radio frequencies)
- ▶ International Maritime Organisation (IMO for maritime communications)
- ▶ World Intellectual Property Organisation (WIPO) and United Nations Educational and Scientific Organisation (UNESCO)

INTERNATIONAL ORGANISATIONS IN SPACE LAW

TELECOMMUNICATION ORGANISATIONS:

INMARSAT (spin off called International Mobile Satellite Organisation), INTELSAT (New Skies Satellites), ARABSAT, EUTELSAT and EUMETSAT

Space Agencies:

NASA, ESA, NASDA, ROSCOSMOS, CNSA, CSA and ISRO (to name a few)

R&D

Committee for Space Research (COSPAR) Estd., under the International Council of Scientific Unions; International Astronautical Federation (IAF); Institute of Space Law (ISL); International Academy of Astronautics (IAA) and The International Law Association (ILA).

- ▶ Outer Space Treaty 1967
- ▶ The Rescue Agreement 1968
- ▶ The Liability Convention 1972
- ▶ The Registration Convention 1976
- ▶ The Moon Agreement 1984
- ▶ These five treaties deal with issues such as the non-appropriation of outer space by any one country, arms control, the freedom of exploration, liability for damage caused by space objects, the safety and rescue of spacecraft and astronauts, the prevention of harmful interference with space activities and the environment, the notification and registration of space activities, scientific investigation and the exploitation of natural resources in outer space and the settlement of disputes.
- ▶ Each of the treaties stresses the notion that outer space, the activities carried out in outer space and whatever benefits might be accrued from outer space should be devoted to enhancing the well-being of all countries and humankind, with an emphasis on promoting international cooperation.

CORPUS IURIS SPATIALIS (1964-1979)

Rocket technology developed in the context of WWII.

The German V-2 rocket reached a range of 250miles.

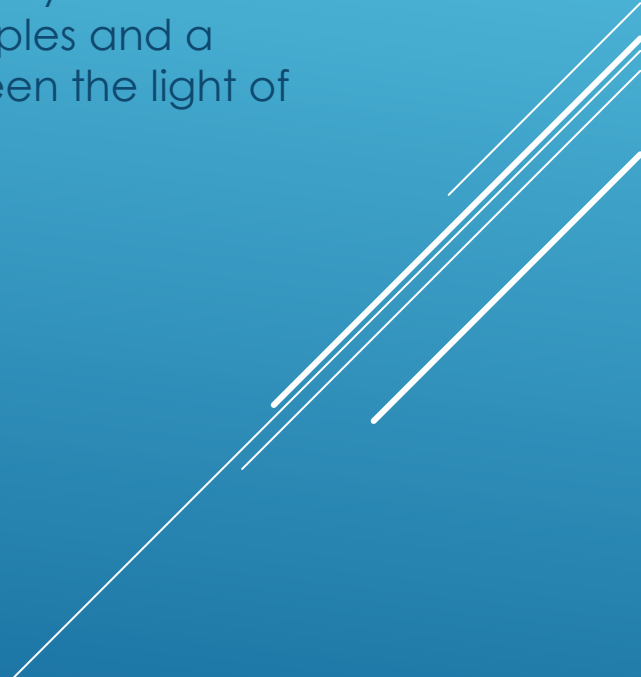
Russia won the race with the launch of Sputnik 1 in 1957.

USA won the race by putting man on the moon in 1969

- ▶ Principles governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting (UNGA Res. 37/92, 1982)
- ▶ Principles relating to Remote Sensing of the Earth from Outer Space (Res. 47/68, 1992)
- ▶ Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of all States, Taking into Particular Account the Needs of Developing Countries (Res. 51/122, 1996) OR Use of Nuclear Power Sources in Outer Space 1996.

OTHER UN OUTER SPACE LAW INSTRUMENTS

The Moon Treaty was the last full fledged international legal instrument adopted by the UN. After this, only Principles and a Declaration have seen the light of the day.

Several white lines of varying lengths and angles are positioned in the bottom right corner of the slide, creating a modern, abstract graphic element.

- ▶ ITU and its World Administrative Radio Conferences (WARCs)
- ▶ Remote sensing – UNGA Principles relating to Remote Sensing
- ▶ Launching – bilateral launch trade agreements so far. Will we see launch services to be fully liberalized and commercialized and even possibly even made applicable to WTO/GATS rules.
- ▶ Communication and Navigation – See GNSS, GALILEO and ICAO SARPs on aeronautical telecommunications.
- ▶ Transportation to space – what is coming our way. Legal and policy steps – are we ready?

COMMERCIAL ACTIVITIES IN OUTER SPACE

- Space telecommunications
 - Exploitation of lunar resources
 - Space Tourism
- 
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