# Defence Space Research Agency(DSRO)

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[Manifest pedagogy]

In the times where the space is becoming a new battlefield there should be created a specialised agency to apply space technology in defence applications. Hence, an aspirant should focus on such developments from both prelims and mains perspective.

**In news**

Recently the government has approved the creation of the Defence Space Research Agency (DSRO).

**Placing it in syllabus**

Science and Technology- developments and their applications

**Static dimensions**

Technological developments in space science in India

**Current dimensions**

- Anti-satellite missile(ASAT)
- DSRO and its structure
- Defence Space Agency (DSA)

**Content**

Space capabilities have become central to many military operations like missile warning, geolocation and navigation, target identification, and tracking of adversary activities. The military and intelligence collection capabilities that government and commercial remote sensing satellites provide is reducing the ability of all countries to remain undetected

while performing military exercises and operations. In this scenario India needs to protect its interests in space, including addressing space-based threats.

ASAT

- In a remarkable technological feat, India conducted **Mission Shakti, an anti-satellite (ASAT) missile test**, in March 2019 by successfully engaging an orbiting target satellite at an altitude of nearly 300 km.
- In the process, it joined as the fourth member of the elite club  of space powers (US, Russia and China) that have demonstrated ASAT capabilities.
- Mission Shakti demonstrates the “nation’s capability to defend its assets in the outer space”.
- This feat was achieved with a totally home-grown technology giving a big boost to the on-going **Ballistic Missile Defence (BMD) programme.**
- It will act as deterrence for satellites, which are in lower atmosphere, mostly spy satellites.
- The missile has not left any debris in space, which could have caused problems for other satellites.
- ASAT has helped India gain global status and a greater say in international negotiations on outer space.

Having demonstrated the technical feasibility, it is natural that India would move towards weaponising this capability and all the associated space technologies so as to effectively deter adversaries from destroying Indian space assets. To weaponise the ASAT capability and related technologies, a dedicated space research agency to harness the full military potential of space is needed.

Though India has always advocated the peaceful use of outer space, the fact remains that space is increasingly being used by countries, particularly the US and China, for military purposes. China operates nearly 70 military satellites in orbit, which perform the tasks of communication, ISR

(Intelligence, Surveillance and Communication) and navigation. China also established a Strategic Support Force (SSF) in 2015, integrating space, cyberspace and electronic warfare (EW) aspects into a joint command under the Central Military Commission. Given this reality of the military utility of outer space, it is logical that India exploits its new capability in the fourth domain of warfare to further national security interests.

- India made a modest beginning in this regard in 2001 by implementing a space based surveillance programme.
- An Integrated Space Cell (ISC) was constituted in 2009 under Headquarters Integrated Defence Staff (HQ IDS) to coordinate the space-related aspects of the three defence forces.
- Now, this Cell needs to be upgraded to a dedicated defence Space Command to cater to all user services. The Command would also be responsible for the operational aspects of all space based platforms and associated assets, besides laying out the strategy and doctrine for space warfare.

Defence Space Research Agency (DSRO)

In addition to establishing a Space Command, India also needs to create a dedicated Defence Space Research Agency (DSRO) to harness the entire spectrum of space technologies with defence applications. The Cabinet Committee on Security headed by Prime Minister has cleared the setting up of this new agency which has been entrusted with the task of creating space warfare weapon systems and technologies. The agency would be providing the research and development support to the **Defence Space Agency (DSA)** which comprises members of the three services. DSRO will be headed by a senior defense scientist who will lead a team of other scientists. The agency is expected to be operational by the end of 2019.

Some of the technologies and areas that DSRO should

exclusively focus upon include

Space Situational Awareness (SSA) Going forward, SSA would play a critical role in mapping and cataloguing space-borne objects for the purpose of devising suitable counter strategies. This would require development and deployment of a vast network of telescopes, long-range radars, and space-based sensors and a dedicated pool of experts to undertake the required task.

SIGINT/COMINT/ELINT/IMAGEINT Satellite All these complex and military grade satellites are primarily used for fulfilling specific military and intelligence community tasks ranging from active and passive intelligence gathering, communication mapping and imaging.

Launch on Demand To meet the urgent requirement of launching satellites in a matter of a few hours, if not days. This capability should include rapidly deployable launch vehicles, launch facilities (both mobile and stationary) and reconfigurable / retrievable launch vehicles, among others.

Directed Energy Weapons (DEW) DEWs is fast emerging as an alternative to direct ascent ASAT missiles and are difficult to attribute to a source. DEWs include systems such as high power microwaves, precision high power lasers and light-directed energy capabilities.

Electronic Warfare (EW) It involves jamming and spoofing technologies to disturb the electromagnetic spectrum and other mission critical systems which are essential for conducting wars in a network centric environment. Some of the examples include global positioning system (GPS) / navigation system / communication system.

Rogue Satellites Used to cause damage to adversary assets, these satellites use a combination of kinetic kill vehicles, high-power microwaves, lasers, jammers, robotic instruments and chemical sprayers.

Greater Sophistication of ASAT The ASAT technology may require continuous upgradation, in terms of miniaturisation of the missile and multiple launch options (ground-, air- and sea-based) to make it more effective.

Defence Space Agency

- In April,2019, the government established the Defence Space Agency, or DSA, to command the space assets of the Army, Navy and Air Force, including the military's anti-satellite capability. The agency is also to formulate a strategy to protect India's interests in space, including addressing space-based threats.
- A joint doctrine developed by the Army, Air Force and the Navy had strongly recommended setting up of Defence Space Agency along with a 'Defence Cyber Agency'.
- The creation of the two agencies is aimed at developing a multidimensional approach to use outer space for strategic purposes.
- The DSA is being set up in Bengaluru under an Air Vice Marshal-rank officer and will gradually take over the space-related capabilities of the three forces.
- DSA will seek input on space as a domain of warfare from the ISRO and DRDO.
- India's existing military space agencies – including the Defence Imagery Processing and Analysis Centre, located in New Delhi, and the Defence Satellite Control Centre, located in Bhopal – will be merged with DSA.

Militarisation of outer space is growing at a faster rate. It is only when India has a deployable ASAT weapon and a range of other space related capacities and capabilities to deter adversaries, can it claim to be a true military power in outer space. Though India already has space organisation ISRO, it has a civilian character and is committed to various international treaties that promote the peaceful or non-military uses of outer space. Changing ISRO's character to military one may not be in the best interest of the

organisation’s progress as well as the national interest. Hence there is a need for a military counterpart of ISRO like DSRO.