

Nonproliferation Policy Education Center  
“Space Lusitania” India-Pakistan Wargame

**Presentation: Emerging Technologies in the India-Pakistan-  
China Strategic Complex**

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# Outline

- 1. Structure of India-Pakistan-China strategic complex and *non-state actor involvement***
- 2. Rising *prominence of UAVs* and crisis management concerns**
- 3. Space as an *emerging strategic domain* of Southern Asian competition**
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# 1. Structure of India-Pakistan-China strategic complex and non-state actor involvement

- India-Pakistan strategic rivalry with multiple conflicts and crises (1947, 1965, 1971, 1999, 2019)
- Militarized dispute over governance of Jammu and Kashmir area a central conflict driver
- China-India military rivalry (conflicts in 1962, 1986, 2020-present)
- Chinese historic military, nuclear, and economic support for Pakistan to ensure it retains strategic parity with their mutual rival India

# 1. Structure of India-Pakistan-China strategic complex and non-state actor involvement

- Since the first India-Pakistan war in 1947, Pakistan's strategies against India have included sponsorship and direction of *militant non-state actors to varying degrees*
- Contemporary non-state actor attack with most significant information in public domain today is 2008 Mumbai attack, perpetrated by Lashkar-e-Taiba (LeT)
- 2019 Pulwama-Balakot crisis was triggered by a Jaish-e-Mohammed (JeM) bombing of Indian paramilitary convoy in Kashmir
- Pakistan presently *incentivized to curtail activities of anti-India non-state actors* hosted on its soil (staying off FATF greylist/blacklist)
- However, questions continue regarding extent of Pakistan's control of these groups, as *they demonstrate access to key emerging technologies*

## 2. Rising prominence of UAVs and crisis management concerns

- Indian officials attributed June 2021 drone-dropped IED attacks on Indian Air Force (IAF) base in Kaluchak, Kashmir to LeT
- Drones made from Chinese components
- Attack targeted air traffic control tower and IAF helicopter, indicating *perpetrators had basic familiarity of base layout, likely from satellite imagery*
- *Pakistan official, LeT, and JeM-operated drones regularly drop weapons, drugs, money into India or India-claimed territory* – Indian officials report 11 interceptions in Jan and Feb 2023 alone
- *China sells drone technologies to Pakistan*, but also deploys surveillance drones against Indian military positions, including intrusions to test Indian Air Force responses
- India also investing in drones, including U.S. MQ-9s, Israeli Herons armed with missiles, indigenous Tata Advanced Loitering System-50 loitering munition platform

## 2. Rising prominence of UAVs and crisis management concerns

- India, Pakistan, and China investing heavily in drone fleets and increasing drone-centric operations directed against each other
- However, “there is a need to define where, when, and what C-UAS capabilities need to be used depending upon the surrounding environment and the kind of targets involved” – Indian official, March 2023
- *Regional uncertainty* around escalation control and crisis management following a *significant attack involving or supported by combat drones*

### 3. Space as an emerging strategic domain of Southern Asian competition: Introduction

- Emerging reliance of India, Pakistan, and China on space-based assets for *military targeting and communications*
- Parallel *growing vulnerability* of these states to interference or incapacitation of these assets
- Rising interest in *counterspace technologies*
- No space security confidence-building measures or strategic dialogue on bilateral or trilateral basis to regulate space strategic competition

**Table 1. A list of current and planned Indian military satellites.** Unless indicated, information is from the US Satellite Database. Blank spaces indicate that the data could not be found for that particular satellite. ("US Satellite Database" n.d.).

Name	Launch Date	Anticipated Lifetime		Use	Capabilities/Details
		(years)			
GSAT-7	8/29/2013	7		Naval Communications	Multiband communications satellite with UHF, S, C, AND Ku transponders
GSAT-7A	12/9/2018	8		Air Force Communications	Multiband communications satellite that networks airbases with radars and Airborne warning and control (AWACS) aircraft (Chakraborty 2018)
Cartosat-2A	04/28/2008	5, still in orbit		Earth Observation	Panchromatic Optical imaging; resolution < 1 m; 9.2 km
Cartosat-2B	07/12/2010	5		Earth Observation	Optical imaging satellite for resource mapping; urban planning; transportation studies; water monitoring
Cartosat-2 C	06/22/2016	5		Earth Observation	Optical imaging satellite with lower orbit for military applications
Cartosat-2D	02/15/2017	5		Earth Observation	Optical imaging satellite for resource mapping; urban planning; transportation studies; water monitoring
Cartosat-2E	01/11/2018	5		Earth Observation	Optical imaging satellite for resource mapping; urban planning; transportation studies; water monitoring; improved earth monitoring with 60 cm resolution covering an area of 9.5 km (D.S. 2017)
Cartosat-3	11/27/2019 (India Today Web Desk 2019)	Unknown		Earth Observation	Optical imaging satellite with alleged 25 cm resolution for cartographic and high-resolution mapping (Raj 2013)
RISat-1	04/25/2012	Unknown		Earth Observation	Imaging satellite that uses C-band synthetic aperture radar for agricultural resource management (Chakraborty 2018)
RISat-2	04/20/2009	Unknown		Earth Observation	Radar imaging with Israeli-built X-band synthetic aperture radar (Chakraborty 2018), with up to 1 m resolution (Singh 2019a), used primarily defence, but can also help with agriculture management and disaster management (PTI 2009)
RISat-2B	05/22/2019 (Singh 2019b)	5 ("PSLV-C46/RISAT-2B MISSION" 2019)		Earth Observation	X-band synthetic aperture radar satellite (Singh 2019b) used for agriculture, forestry, disaster management support ("Indian PSLV Launches RISAT-2BR1 Military Satellite 2019), as well as surveillance (Singh 2019b)
RISat-2BR1	12/10/2019 ("Indian PSLV Launches RISAT-2BR1 Military Satellite" 2019)	5 ("Indian PSLV Launches RISAT-2BR1 Military Satellite 2019)		Earth Observation	X-band synthetic aperture radar satellite used for geographic and military monitoring ("RISAT 2B, 2BR1, 2BR2" 2020), with 0.35 m resolution over 5 to 10 km swaths, day and night visibility (Singh 2019c)
RISat-2BR2, RISat-1A, RISat-1B, RISat-2A	Within 1 year of 05/2019 (Singh 2019b)	Unknown		Earth Observation	To increase surveillance of border with Pakistan and Chinese ships in Indian Ocean (Singh 2019b)
Microsat-TD	01/11/2018	Unknown		Earth Observation	Optical imaging satellite that can create panchromatic, color and near-infrared imagery
HySIS	11/29/2018	5		Earth Observation	Hyperspectral imaging for agriculture and resource management; disputed military role (Ramesh 2018a); can collect data across 316 bands in the visible, near-infrared and shortwave infrared spectra
EMISAT	04/01/2019 (C. Kumar 2019a)	Unknown		Military (C. Kumar 2019b)	Detects radar and microwave signals for defence intelligence (Singh 2019a)



### 3. Space as an emerging strategic domain of Southern Asian competition: India

- India founds Defence Space Agency in Nov. 2018, to coordinate protection of civilian and military space assets
- March 2019 “Mission Shakti” KE-ASAT test
- India formed Defence Space Research Agency in June 2019, intended to “work towards creating *space warfare weapon systems and technologies*” (Lele 2022).
- New Delhi currently developing *satellite-blinding laser* and *cyber jamming capabilities* (Lt. Gen. (Retd.) Panag 2021, former Commandant of Military College of Telecommunication Engineering)



### 3. Space as an emerging strategic domain of Southern Asian competition: Pakistan

Name of Satellite, Alternate Names	Purpose	Class of Orbit	Launch Site	Contractor	Launch Vehicle	Comments
Paksat-1R	Communications	GEO	Xichang Satellite Launch Center	China Aerospace Science and Technology Corp. (CASC)	Long March 3B	12 C-band, 18 Ku-band.
PakTES-1a	Earth Observation	LEO	Jiuquan Satellite Launch Center	CAST/DFH Satellite Co. Ltd.	Long March 2C	Remote sensing
PRSS-1 (Pakistan Remote Sensing Satellite-1)	Earth Observation	LEO	Jiuquan Satellite Launch Center	CAST/DFH Satellite Co. Ltd.	Long March 2C	Support monitoring of natural resources, environmental protection, disaster management and emergency response, crop yield estimation, and urban planning. Also provide remote sensing information for the establishment of the China-Pakistan Economic Corridor.
Paksat-MM1R	Communications and Earth Observation	GEO	China	China Great Wall Industry Corporation (CGWIC)	TBD – Launch Scheduled Q1 2024	C, Ku, Ka, L Bands
PRSC-EOS (3 satellites)	Earth Observation		TBD	TBD	TBD	Remote sensing
PRSS-2 (Pakistan Remote Sensing Satellite-2)	Earth Observation	LEO	TBD	TBD	TBD	Remote sensing

Table data from Union of Concerned Scientists Satellite Database and Pakistan Space & Upper Atmosphere Research Commission (SUPARCO)

### 3. Space as an emerging strategic domain of Southern Asian competition: Pakistan

- Pakistan has historically relied upon China for space program technical assistance, including launch services
- Islamabad began transferring its space-based navigational system from GPS to Beidou in 2013, and signed an agreement to host five Beidou base stations and one processing center that same year
- Pakistan gained access to Beidou's military service in 2014, enabling greater precision
- “Pakistan's conventional arms appear to be increasingly tied to and dependent on China's BeiDou navigation satellite system for positioning, navigation, and timing, particularly its leading air-delivered strike capabilities, *such as the Raad II and Babur cruise missiles, and the Ababeel ballistic missile*” (Lalwani 2023)
- Pakistan strategic analysts recommend *developing anti-India counterspace measures*, but these will likely require Chinese technical assistance

## 4. Missile-centric strategies and unintended escalation risks

- India: Growing reliance on dual-use Brahmos and Nirbhay cruise missiles, Prahaar and Pinaka short-range ballistic missiles, Agni-P medium-range ballistic missile, in strategic planning and posturing
- Pakistan: Similar emphasis on dual-use Ra'ad and Babur cruise missiles
- China: DF-26 dual-use ballistic missiles reportedly stationed at India-facing bases in Yunnan and Xinjiang
- Highly unlikely that any state has developed separate satellite system for nuclear operations; *its military uses the same satellites for conventional and nuclear planning, targeting, and communications.*
- Crisis actions to erode rival satellite capabilities could therefore be viewed by the rival *as also eroding its nuclear forces.*

A museum exhibit featuring a large globe of the Earth in the lower right corner. Several satellite models are suspended in the air, connected to thin, curved metal rods that represent orbital paths. The satellites are primarily yellow and gold, with some having solar panel arrays. The background is a dark, industrial-looking ceiling with some lights. A white rectangular box with a black border is centered in the image, containing the text "Q&A".

**Q&A**