

DEFSAT 2024

7-9 FEBRUARY, 2024

Organised By



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T A B L E O F C O N T E N T



03 Day 1 :DefSAT 2024 Inaugurates with India and Australia Uniting in Pioneering Space Collaboration

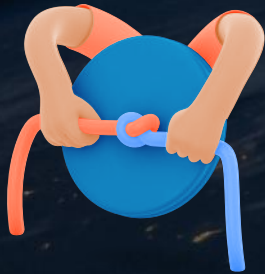
08 Day 2: DefSat 2024 holds IndSpace Wargame to build future defence space capabilities

12 Day 3: DefSAT 2024 Wraps Up with SIA-India's Focus Cybersecurity Cooperation

16 Key Recommendations

"DefSAT 2024, organized by SIA - India, aligns with the visionary goals of the Prime Minister and the Defence Ministry to modernize India's space sector. The event, held from 7th to 9th February 2024 at the Manekshaw Centre in New Delhi, convened over 500 stakeholders, including government officials, military leaders, industry professionals, academics, and experts. This gathering facilitated collaboration and knowledge exchange among various sectors, reflecting India's commitment to advancing its space capabilities."

~Dr. Subba Rao Pavuluri, President, SIA-India



Building defence space capabilities for the future

S U M M A R Y R E P O R T

Successful Culmination

DefSAT 2024 Unveils Blueprint for Defence Space Future Readiness

3 Days 11 Discussion Rounds

90+

Unique Speakers

500+

Attendees including
Indian Embassies
Abroad
Participated
Remotely

15

Exposition
Partners

9

Govt Partners

30+

Industry Partners

DEFSAT 2024 – Day 1 Summary



Defence Space future Readiness

Aligning with the visionary goals outlined by the Prime Minister and the Defence Ministry, DefSAT 2024 begins with the agenda to chart a course towards a modern and future-ready sector, safeguarding India's aspirations and interests. Organized by SIA - India, DEFSAT 2024 commenced with an inaugural session attended by government officials, military leaders, industry professionals, academics, and experts. Scheduled from 7th to 9th February 2024 at the Manekshaw Centre in New Delhi, DefSAT 2024 brought together more than 500 visionaries, thought leaders, and stakeholders, facilitating an unprecedented convergence of expertise from government agencies, armed forces, policymakers, space industry leaders, technology innovators, and diplomats, this included a global audience representing Indian Embassies abroad who attended the live streaming of the conference proceedings.

"DefSAT 2024 unfolds at a pivotal juncture as India, propounds a visionary Space Policy and the New Telecom Bill, embracing a future with robust space capabilities and a thriving commercial presence. SIA-India is proud to have the support from pivotal government entities and esteemed organizations such as Niti Aayog, ISRO, NSIL, IN-SPACe, DoT, DRDO, and Ministry of Defence. The agenda spans three days, offering insightful deliberations in comprehensive sessions on diverse defence space topics, including interactive exercises and industry roundtables for practical insights and collaborative discussions."

~Anil Prakash, Director General, SIA-India



Indian armed forces have earmarked funds to the tune of Rs 25,000 crore to meet its defence space requirements, highlighting the significant investment in this sector, and presenting a significant opportunity for the private sector to leverage.

Gen Anil Chauhan, Chief of Defence Staff;
Ministry of Defence, Govt of India

The inaugural lineup of notable speakers and dignitaries adding to its prestige and depth include Gen Anil Chauhan, Chief of Defence Staff; Ministry of Defence, Govt of India, His Excellency, Mr Philip Green, Australia's High Commissioner to India, Dr Shailesh Nayak, Director NIAS, Former Secretary Ministry of Earth Science; AVM Sanjay Bhatnagar, Director, CENJOWS; and Lt Gen PJS Pannu, Chairman Space Committee on Defence, SIA-India.

General Chauhan stated that the Indian armed forces have earmarked funds to the tune of Rs 25,000 crore to meet its defence space requirements, highlighting the significant investment in this sector, and presenting a significant opportunity for the private sector to leverage.

Mr. Philip Green highlighted the symbiotic relationship between Australia and India in driving technological advancement, stressing their natural alignment as strategic partners. He emphasized Australia's robust satellite tracking capabilities and thriving robotics industry, which complement India's status as a tech giant. Their collaboration aims to propel progress in space technology and deepen bilateral ties.

Mr. Green also emphasized the strategic partnership in space collaboration, marked by the signing of an MoU between SIA-India and the Space Industry Association - Australia, fostering growth in the global space sector through knowledge exchange and business collaboration.



The strategic partnership in space collaboration, marked by the signing of an MoU between SIA-India and SIAA, would foster growth in the global space sector through knowledge exchange and business collaboration.

Mr Philip Green, Australia's High Commissioner to India

Dr. Shailesh Nayak highlighted the critical role of scientific research and academia in supporting India's space endeavors, emphasizing their significance in driving innovation and technological advancement.

Lt. Gen. PJS Pannu emphasized India's strides in space exploration, underscoring the need for military engagement in light of evolving security challenges. He also stressed the importance of result-based budgeting in navigating economic warfare, advocating for the use of methodologies like MOSAIC to ensure strategic resource allocation and operational efficiency

SIA-India MoU with SIAA

The MoU signing between SIA-India and the Space Industry Association of Australia (SIAA) signifies their commitment to deepen collaboration and foster mutual growth in the space industry. Notable figures present included Gen Anil Chauhan, Chief of Defence Staff, and Australia's High Commissioner to India, Mr. Philip Green. This alignment also supports sustainable practices in space exploration, reflecting a shared vision. The timing of this agreement coincides with the Indo-Pacific and QUAD partnerships, highlighting potential for cooperation to advance shared interests.



Panel Discussions



Key sessions explored critical topics in defence and space. Chaired by Dr P V Radhadevi, Director of Advanced Data Processing Research Institute (ADRIN-ISRO), and Air Marshal Anil Chopra, PVSM, AVSM, VM, VSM (Retd), Director General of the Centre for Air Power Studies (CAPS), discussions covered Meshed Intelligence: Multi-sensor Payloads and Analytical Platforms and C5I2STAR2-Space enabled Precision and deep battles. They delved into advanced payloads, Data Fusion, AI integration, and the convergence of Earth Observation Sensors for Intelligence, Surveillance, and Reconnaissance (ISR) and precision battles.

Another session, chaired by Maj Gen C S Mann, VSM, Additional Director General of the Army Design Bureau, focused on Collaborative Frontiers: Synergising the Defence Innovation Ecosystem. Additionally, Air Marshal GS Bedi, AVSM, VM, VSM (Retd), Former Director General (Flight Inspection & Safety) and Distinguished Fellow at CAPS, chaired a session on Redefining Aerospace – Near Space and Space Sovereignty, discussing the evolving landscape of air and near space dynamics, ISR operations, and strategies for seamless integration across domains.

Key Takeaways

Integration: Military satellite communication integrated with IoT for enhanced connectivity.

Analytics: AI and ML used for informed decision-making with large data volumes.

Miniaturization: Cost-effective deployment through satellite miniaturization.

Data Processing: Prioritizing data processing for optimized decision-making.

ISR: Real-time monitoring via Intelligence, Surveillance, and Reconnaissance capabilities.

Remote Sensing: Balancing resolution for data quality optimization.

Algorithm Awareness: Understanding limitations of ML algorithms for effective data processing.

Navigation Accuracy: Vector data and crowdsourcing improve navigation accuracy.

Quantum Potential: Potential of quantum computing for data processing revolution.

Standardization: Standardizing data collection methods for better interoperability.

Exhibition



LINEUP

"EMPOWERING INNOVATION"

The Exposition Partners included XDLINX Labs, Anritsu, Avintel GalaxEye, JV Micronics, AgniKul Cosmos, KaleidEO, Optimum Viking Satcom (India) PVT LTD, Saptang Labs, Pixxel, and Maitravaruna, Arm4AI, Astrome, RDVW, and Amity University.



DEFSAT 2024 – Day 2 Summary



Defence- Space future Readiness

The second day of DefSat 2024 dawned with a remarkable assembly of esteemed dignitaries, marking a pivotal moment in the convergence of strategic discussions and visionary insights. The inaugural session featured notable figures including the Hon'ble Lt. Gen Gurmit Singh, Hon. Governor of Uttarakhand along with Dr. Samir V Kamat, and Secretary DDR&D and Chairman DRDO, both recognized pioneers in their respective fields

Lt. Gen Gurmit Singh, Hon. Governor of Uttarakhand emphasized the strategic significance of a ₹1 trillion budget allocation for technological research, signaling a shift towards leveraging private sector capabilities. Initiatives like the IndSpace wargame provide insights for innovation, highlighting the collaborative approach needed for sustainable progress.

Dr. Samir V Kamat emphasized space's critical role in national security, particularly in navigation, ISR, and ballistic missile defence. He highlighted initiatives like Space Situational Awareness (SSA) and startup funding under the Technology Development Fund (TDF), showcasing commitment to innovation and resource facilitation for cutting-edge research.

Dr. Subba Rao Pavuluri outlined the meticulous process of acquiring military-grade space assets, involving research, development, qualification, and testing phases. This comprehensive approach, supported by cutting-edge technology and industry collaboration, aims to enhance national security and readiness in outer space.

Lt Gen PJS Pannu stated that DefSAT 2024 serves as a pivotal platform to address transformative needs in defence space capabilities. It's more than an intellectual exchange; it's a call for action, fostering discussions on decision-centric warfare, autonomous systems, and AI integration in the military, including Mosaic Warfare principles. With support from government departments, organizations, and industry leaders, DefSAT 2024 promises cutting-edge discussions, workshops, and wargames, propelling India's defence space capabilities forward.

IndSpace Wargame

The IndSpace Wargame, also known as the Industrial Space Wargame, played a pivotal role in assessing the readiness of the space industry through simulated scenarios. There were eight scenarios played during the wargame. Different teams belonging to Defence, Industry, Academia, Lawyers, and regulators responded to these scenarios from their perspective.

SIA-India's second interactive tabletop exercise engaged key stakeholders from various sectors, including Services, MoD, ISRO, DRDO, and academia. Divided into four categories - Orange for Defence Forces, White for Policymakers, Green for Industry, and Silver for Academia. This industrial wargame brought Industry, Defence and stakeholders very close to understanding the needs of each other for forging better synergy.



Dignitaries conducting the exercise:

Lt. Gen Vinod G. Khandare PVSM, AVSM, SM (Retd), Principal Advisor, Ministry of Defence
 Lt Gen PJS Pannu, Chairman Space Committee on Defence, SIA-India
 Dr. Subba Rao Pavuluri, President SIA-India and CMD Ananth Technologies

Thought leaders participating:

Vice Admiral Pradeep Chauhan, AVSM, VSM (Retd), Director General, NMF
 Air Marshal Anil Chopra, PVSM, AVSM, VM, VSM (Retd), DG CAPS
 Lt Gen Dushyant Singh PVSM AVSM, Director General, CLAWS
 AVM Sanjay Bhatnagar VM VSM (Retd), Officiating Director, CENJOWS



Defence Forces

- Prioritize budget allocation for space ISR capabilities to ensure effective threat detection and analysis.
- Foster closer collaboration between military and civilian sectors to enhance overall defence capabilities.

"Establishing clear military-grade standards for space operations is imperative to uphold security and reliability. Mosaic Warfare is the optimal approach for configuring the Internet of Battlefield Things (IoBT) and the Internet of Military Things (IoMT) enables the design of battles with adaptable configurations."

~Lt Gen PJS Pannu, PVSM, AVSM, VSM (Retd), Chairman Space Committee on Defence, SIA-India

Policymakers

- Facilitate partnerships between defence and civil sectors to leverage expertise and resources efficiently.
- Advocate for increased funding and support for space initiatives to meet evolving security needs.
- Encourage the development of comprehensive policies to address challenges and opportunities in space technology.
- Space and Cyber have become seamless for network integration.

Academia

- Promote interdisciplinary collaboration in space research to address complex security challenges.
- Foster partnerships between academia and industry to drive innovation and technology transfer.
- Support the development of educational programs to cultivate talent and expertise in space-related fields.

Industry

- Advocate for sustained investment in space technology research and development.
- Enhance communication channels between industry and end users to ensure alignment with operational requirements.
- Explore innovative solutions and alternative space launch capabilities to enhance flexibility and resilience.



India Space Congress Report Release

SIA-India recently unveiled the India Space Congress 2023 Report, graced by the esteemed presence of Hon'ble Lt. Gen Gurmit Singh, the Honorable Governor of Uttarakhand, alongside Dr. Samir V Kamat, Secretary of DDR&D and Chairman of DRDO. This report encapsulates comprehensive deliberations from the ISC 2023, featuring nuanced recommendations and insights.

To access and download a copy of this insightful report, please visit the SIA-India website: SIA-India Reports & Publications or Scan



We must leverage our technical credibility and excellence to propel our endeavors forward. Space Holds Tremendous Potential in Realizing Our Vision for 2047: Aiming to Attain the Status of 'Vishwa Guru'. Harnessing the Power of Space Technology and Exploration is Crucial in Advancing Toward this Ambitious Goal.

Lt. Gen Gurmit Singh, PVSM, UYSM, AVSM, VSM (Retd.)
Hon'ble Governor of Uttarakhand

Panel Discussions

Two dynamic panels examined critical facets of defense space technology. The first panel, chaired and moderated by Vice Admiral Pradeep Chauhan, explored "Smart Satellites for Defence: Balancing Robustness, SWAP, and Flexible Design & Manufacturing." It delved into the intricacies of smart satellites, emphasizing the crucial balance between robustness, SWAP considerations, and emerging technologies. Action items highlighted the necessity for dialogues on ground station regulations and cost optimization.

The second panel, chaired by Lt Gen (Dr) Subrata Saha, and moderated by AVM Rajiva Ranjan, focused on the "Acquisition Process for Military-Grade Space Assets." Experts discussed challenges in aligning user requirements with industry capabilities and proposed solutions such as establishing a dedicated space acquisition executive and enhancing funding for startups.



Key Takeaways

Operational Requirements Customization: Tailor operational strategies to specific mission objectives, ensuring adaptability and efficiency in achieving desired outcomes.

Enhanced Collaborative Platforms: Foster collaborative efforts across sectors by establishing structured platforms, promoting synergy, and leveraging diverse expertise.

Engagement with International Partnerships: Strategically engage with foreign partners to capitalize on their expertise, fostering mutually beneficial collaborations and advancing India's space capabilities.

Space Asset Acquisition Framework: Appoint specialized executives to oversee efficient procurement processes and develop tailored policy frameworks to streamline the acquisition of space assets.

Satellite Design Optimization: Prioritize the design of satellites for optimal performance, reliability, and radiation shielding, ensuring longevity and effectiveness in space missions.

Investment in Ground Systems Development: Allocate resources to develop robust ground systems infrastructure integrated with artificial intelligence (AI), enabling efficient satellite operations and data management.

Adoption of Emerging Technologies: Embrace emerging technologies to enhance space capabilities, fostering innovation and staying abreast of advancements in the field.

Regulatory Framework Enhancements: Advocate for clear regulatory guidelines and foster collaboration on space debris management, ensuring responsible and sustainable space exploration practices.



DEFSAT 2024- Day 3 Summary

On Day 3, SIA-India solidifies a cybersecurity partnership by signing an MoU with the Information Sharing and Analysis Center (ISAC) to enhance India's cyber resilience. This collaboration aims to fortify defence mechanisms, foster information exchange, and promote proactive cyber defence practices in the space sector, safeguarding space operations' integrity and security.

With the participation of over 500 stakeholders, including government bodies, armed forces, policymakers, industry leaders, and diplomats, alongside a global audience via live stream, DefSAT 2024 reflected a significant step forward in India's cybersecurity preparedness, in line with the visionary objectives of the Prime Minister and the Defence Ministry.

The opening plenary lineup of notable speakers and dignitaries include Dr. Ajay Kumar, Former Secretary of the Ministry of Defence, Mr. Mahaveer Singhvi IFS, Joint Secretary of New Emerging and Strategic Technologies (NEST) and Air Vice Marshal Pawan Kumar, VM, Director General of the Defence Space Agency (DSA)

Dr. Ajay Kumar emphasized the crucial role of defence space and urged accelerated budget allocation for this rapidly evolving sector. He highlighted the potential of startups in leveraging the vibrant ecosystem and underscored India's attractiveness to global private equity. NavIC's expansion into civil and defence sectors is crucial for strategic navigation, while robust cryptographic protocols are essential for satellite communication security. Additionally, he suggested that the Defence Acquisition Procedure should support innovation in services and manufacturing to simplify procurement processes.

Mr. Mahaveer Singhvi IFS addressed various topics including the new space policy, interim budget, international collaboration, and industry challenges. He highlighted IN-SPACE's vision for a \$22 billion investment over the next decade, projecting India's space industry to reach a \$44 billion market by 2033, with export sales of \$11 billion.

Air Vice Marshal Pawan Kumar referenced Operation 1991, commonly known as Desert Storm, hailed as the pioneering "space war" that leveraged GPS, precision-guided weapons, and satellite communication as integral components rather than mere supplements. Reflecting on the costly and data-intensive nature of space ventures, he underscored the imperative of maximizing resource utilization and fostering civil-military fusion.

Lt. Gen. PJS Pannu, Chairman of the Defence Space Committee at SIA-India, envisions a transformative trajectory for the Indian Military, amalgamating the realms of Land, Air, and Sea into a seamlessly integrated force fortified by cyber security measures. This holistic approach encompasses Space, Cyber, and Digital (ICT) capabilities, underscoring the imperative for a cyber-secured environment. ISAC serves as the linchpin in this endeavour, providing a vital nexus for intelligence gathering on cyber threats to critical infrastructure.

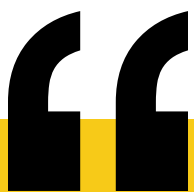




SIA-India Inks MoU with ISAC

The partnership between SIA-India and ISAC establishes a collaborative framework aimed at fortifying the nation's space and defence cybersecurity posture and safeguarding essential assets from cyber risks. This holistic approach encompasses Space, Cyber, and Digital (ICT) capabilities, underscoring the imperative for a cyber-secured environment.

ISAC serves as the linchpin in this endeavour, providing a vital nexus for intelligence gathering on cyber threats to critical infrastructure. It emphasizes the necessity for military engagement amidst our evolving security landscape, highlighting the pivotal role of cybersecurity in modern decision-centric warfare.



The Defense Acquisition Procedure has undergone several transformative changes over the last few years, which have enabled the overall private innovation ecosystem in the country, particularly in the domains of satellites and the space segment. I believe the DAP needs to proactively facilitate innovation on both the services and manufacturing fronts to streamline the procurement of innovative technologies."

Dr. Ajay Kumar
Former Secretary, Ministry of Defence

Panel Discussions

Day 3 featured four insightful panel discussions, each addressing critical aspects of space warfare, communications strategies for modern military operations, space control management, and policies for securing India's security interests. The first panel, Space warfare: Space Deterrence and Space Domination, chaired and moderated by Air Vice Marshal Pawan Kumar, VM, Director General, Defence Space Agency (DSA), delved into the complexities of safeguarding space assets amidst emerging threats. Key topics included space situational awareness, agile launch capabilities, and resilience against adversarial actions.

In the second panel, Comms Strategies for Modern Military Operations under contested and EW environment, chaired and moderated by Maj Gen Manjeet Singh SM, experts discussed communication strategies tailored for modern military operations in environments fraught with electronic warfare challenges. They addressed cybersecurity, spectrum requirements, and the strategic decision between dedicated and leased SATCOM capacity.

The third panel, Managing space control, information and Mosaic C2 enabled by effective ground infrastructure, chaired and moderated by Lt Gen PJS Pannu, focused on the critical role of ground infrastructure in managing space control and Mosaic C2 for military operations. Topics included mosaic warfare concepts leveraging AI/ML technologies, laser communication, and decentralized decision-making.

Lastly, the Industry Roundtable, chaired by Air Chief Marshal R K S Bhadauria, centred on catalyzing national industrial capabilities for space and defence. Discussions revolved around technology development, public-private partnerships, investments in R&D, and skilling initiatives.

Key Takeaways

Maximize Dual-Use Technologies:
Leverage NavIC navigation systems and quantum encryption for both civilian and military purposes, enhancing satellite capabilities.

Simplify Defence Acquisition:
Streamline procurement processes to encourage innovation in services and manufacturing.

Develop Indigenous SSA Capabilities:
Invest in indigenous Space Situational Awareness (SSA) to monitor adversary activities.

Ensure Communication Resilience:
Utilize AI, quantum encryption, and satellite constellations for secure communication networks.

Build Robust Ground Infrastructure:
Develop laser communication and other infrastructure for effective space control.

Foster Public-Private Partnerships:
Incentivize private investments in R&D through partnerships.

Formulate Clear Policies: Standardize definitions and draft coherent military space doctrines.

RECOMMENDATIONS



1

CHARTING THE ROADMAP FOR DEFENCE SPACE READINESS

Develop a comprehensive roadmap for defence space readiness, fostering collaboration among government, research institutions, industry, and military stakeholders.

2

SECURING INDIA'S SPACE INTERESTS

Formulate robust policies, doctrines, and strategies to safeguard India's space interests, emphasizing transparency, cooperation, and adherence to international norms.

3

STRENGTHENING NATIONAL INDUSTRIAL CAPABILITIES

Some employees have not yet responded when asked what they liked best about the company.

4

IMPROVING SPACE PROCUREMENT PROCEDURES:

Streamline acquisition processes for military-grade space assets to align user requirements with industry capabilities and enhance funding mechanisms. Simplify defence acquisition policies to encourage innovation in services and manufacturing.

5

INVESTING IN INDIGENOUS SSA CAPABILITIES

Develop indigenous Space Situational Awareness (SSA) capabilities to monitor adversary activities and prioritize debris avoidance, enhancing India's space asset protection.

Conclusion



DefSAT 2024 marks the beginning of a collaborative effort to advance India's defence and space capabilities. SIA-India, as a key organizer, is committed to implementing the recommendations from the conference in partnership with various stakeholders. The true culmination of the event will be seen in the translation of these recommendations into concrete actions and policies, reinforcing India's position as a leader in defence and space technology.



SIA-India remains dedicated to fostering innovation and collaboration in the space industry, driving towards a modern defence sector. Sustaining the momentum generated by DefSAT 2024 requires continued dialogue, collaboration, and coordinated efforts from all stakeholders to maximize impact.



SIA-India is slated to release a comprehensive report on the proceedings of the DefSat 2024 conference, highlighting key discussions, insights, and outcomes. Additionally, they will publish a separate report focusing on the IndSpace wargame, offering detailed analysis and nuanced recommendations derived from the simulation exercises. For reference to the DefSat 2023 Conference report, please visit the SIA-India website: <https://www.sia-india.com/category/reports-publications/> or Scan:



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