Book Review

Arvind Gupta, Amitav Mallik, and Ajey Lele (eds), Space Security: Need for Global Convergence (Pentagon, 2012)

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The book, *Space Security: Need for Global Convergence*, is about organising the commons of Outer Space. The international legal framework for Outer Space, which has been in place for the last four decades, has, time and again, affirmed that Space must be used for peaceful purposes. Starting with the Outer Space Treaty in 1967, this framework has grown to include the Astronaut Rescue Agreement (1968), the Liability Convention (1972), the Registration Convention (1979) and the Moon Agreement (1979), as well as a range of other international and bilateral agreements, and relevant rules of customary international law. Thanks to this framework, it has been possible to maintain a peace balance in Space, which has enabled scientific and commercial use of Space unaffected by military interventions.

This peace balance is under dire threat. The threat, both substantial and urgent, is from weaponisation of Space, fuelled by political–military doctrines of some individual countries in their bid to gain dominance of Space. What happens if Space is weaponised? For one, Space would become intensely contested. In the Space domain, it would cause serious problems not only to orbits and frequency allocations but also to traffic control, launch, and re-entry range safety. It will have implications beyond the Space domain, disrupting worldwide services upon which the civil, commercial and financial sectors depend. It will cripple telecommunications, telecasting, weather forecasting, remote sensing, and development communications. The existing Space systems and their supporting infrastructure are likely to face a range of man-made threats that could potentially deny, degrade, deceive, or destroy them. It would create chaos in Outer Space and eventually lead to Space anarchy. Potential for Space anarchy is an unavoidable outcome of Space weaponisation.

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Weaponising Space will further exacerbate current problems with Space debris. Space is already congested with hundreds of thousands of debris pieces, both small and large. There are 3,00,00,000 pieces, which are less than 1 cm, and 100,000 pieces, which are between 1 cm to 10 cm. These pieces can cause holes in a satellite on collision. There are about 11,000 pieces of more than 10 cm, which can cause irreparable damage to Space assets. Debris caused by Space weapons will add exponentially to this congestion. For example, when China conducted an anti-satellite (ASAT) test in January 2007, it generated over 2,600 pieces of trackable debris and an estimated 100,000 pieces of debris too small to track. This debris cloud will pose an increased risk to both human spaceflight and satellites for many decades, with some debris predicted to remain in orbit well into the twenty-second century. Scientists have warned that, if more satellites were to be destroyed in a Space war, Earth would be encased in a dense cloud of debris, effectively preventing future satellite stationing and Space access.[1]

Clearly, weaponising Space would seriously undermine peaceful use of Space by all nations. But this has not prevented countries like China and the United States (US) from developing ASAT weapons. China, in fact, launched a missile on January 12, 2007, and destroyed a weather satellite in polar orbit. Despite China's debatable claim that the direct-ascent ASAT test was merely a peaceful scientific experiment and not directed at any specific state, this flight test clearly demonstrated China's technological capability to develop a weapon to attack satellites in low Earth orbit. China is pursuing a multidimensional programme to develop counter-Space capabilities that could be used to deny others access to, or operations in, Outer Space. In addition to capabilities provided by its ground-based direct-ascent ASAT system, China now has the capacity to jam common satellite communication bands and satellite navigation receivers. It is also developing other technologies and concepts for advanced kinetic weapons as well as directed energy (laser and radio frequency) weapons for ASAT missions.[2] Citing the requirements of its manned and lunar Space programmes, China is improving its ability to track and identify satellites (a prerequisite for effective, precise physical attacks in Outer Space). Obviously, while vying for parity with the US in control of Space, the long-range goal for China is to emerge as the next powerful nation in Outer Space.

The US sees China's ASAT test of 2007 as a "wake up call". The US has dominated Space over the last six decades, and is not willing to lose its supremacy. The US technology strategy and drive is clearly aimed at achieving and maintaining superiority. The US Space Policy of 2010 reinforces its vision for domination of Space and expansion of its expertise. The US has not yet introduced any

weapon in Space, but technology trends and political compulsions, which the book analyses comprehensively, indicate that the US would eventually introduce weapon technology in Space, perhaps in a phased manner, so that it is in a position to control the pace of technology race in Space. For example, the book cites the instance of the US launching a spy plane on April 22, 2010, on a classified test mission that landed back on December 3, 2010. Officially, it was stated that the mission was the flying test bed for new Space sensors and other next-generation satellite equipments. However, as the book points out, and rightly so, this spy plane could be the platform for future Space weapons and this spacecraft is America's attempt at getting military dominance of Space.

So, China's ASAT test of 2007 has strengthened the trend towards the weaponisation of Space. Can this be reversed? Is the present framework of international law governing Space adequate to prevent weaponisation of Space? Since the existing peace balance in Space is under serious threat, can all Space-faring nations get together and agree on how best to preserve the peace balance in Outer Space? Which country will provide the lead? Can we have a code of conduct that can strike a balance amongst the rights of Space-faring nations as well as the responsibilities of the Space-capable nations?

The larger issue, however, is that of protecting Space assets that the Space-faring nations have assiduously built over the years. For example, India has Space assets valued at about Rs 120,000 crore. India's economic development and security interests depend vitally on the security of these assets. It is imperative that we not only protect our Space assets during peace times but also reduce the operational vulnerabilities during times of conflict. What are the threats to our Space assets? Is there a need to augment our capabilities to protect our legitimate interests in Outer Space? Do we need a national Space security policy? What could be the institutional structure to plan, formulate and implement a Space security policy?

These are the questions that the book seeks to answer through a compilation of articles written by eminent experts selectively drawn from academia, research organisations, and concerned government departments. With respect to the first set of questions, the book suggests that India should assume the leadership role in initiating a dialogue for arriving at a consensus on what could be the limits to the military application of Space that can co-exist with civilian use of Space without any mutual interference. If this could result in an international agreement among nations to operate within well-defined Space security zones, it would be a major confidence-building measure. India, with its impeccable record of responsible

conduct in peaceful use of Outer Space, has the right credentials for taking the lead in building the backdrop for such an international agreement.

With respect to the second set of questions, the book offers two important suggestions. First, India must enhance its indigenous capabilities to remain competitive in Space technology and the Space services domain. Development of critical technologies such as missile defence, advanced sensors, micro-satellites, and directed energy weapons needs be pursued with renewed urgency to build indigenous strength and, in the process, bridge the technology gap with advanced nations, so that India does not become one of the targets for Space arms control regimes again. Second, India needs to evolve and articulate a Space security policy to formulate and implement Space security strategies keeping defence and national security interests in mind. Such a policy must include clear articulations of how India should build and deploy desired capabilities to support high priority military objectives in Space for the Indian defence forces and, also, of the desired configuration of institutional structures that need to be created for effective planning and execution of such policies.

The agenda of action that the book proposes is beneficial in two ways: (i) it will preserve the peace balance in Outer Space; and (ii) it will help ensure the security of India's Space capabilities. There can be no disagreement on the basic thesis of the book that our Space assets must be protected and that Space should be utilised for national security needs while ensuring, at the same time, that Space is not weaponised. One only hopes that the government takes urgent steps to evolve and articulate a national Space security policy and sets up the Space security commission, as suggested in the book.

Notes:

1. J. Primack, "Pelled by Paint, Downed by Debris", *The Bulletin of Atomic Scientists*, September/October 2002.
2. "State of Space Security", Speech by Donald Mahley, Acting Deputy Assistant Secretary for Threat Reduction, Export Control Government of United States, at George Washington University, January 24, 2008, available at http://www.cfr.org./china/state-space-security/p15365, accessed on February 14, 2012.