



## Science Reporter

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### ISRO's SOARING ROCKET, INDIA'S SOARING PRIDE

The launch of India's PSLV-C23 rocket was delayed by the prospect of satellite debris hurtling through space crashing into it. But eventually the Indian Space Research Organisation's workhorse Polar Satellite Launch Vehicle PSLV-C23 lifted off from the First Launch Pad at the Satish Dhawan Space Centre in Sriharikota at 9.52 am on 30 June 2014. It carried with it five satellites from four foreign countries. And between 17 and 19 minutes after liftoff, the PSLV placed all the five satellites into their intended orbits.



The probable space debris was from the 2011 collision of a US satellite and a Russian satellite at altitudes above 600 km. The two objects identified three days before the launch were 15 cm to 20 cm across. Travelling at great speeds, space debris measuring even a few inches across can damage spacecraft. However, with a delay of three minutes PSLV-C23 successfully avoided the debris without affecting the mission because it had a launch window period of 20 minutes. Since debris in space moves at a velocity of several kilometres per second, by slightly delaying the launch the objects can be avoided by thousands of kilometres.

With the successful insertion into orbit of all the five satellites riding on PSLV-C23, ISRO has notched up an impressive total of 40 foreign satellites from 19 countries that it has successfully launched so far, earning substantial sums of foreign exchange for the country. The countries include Algeria, Argentina, Austria, Belgium, Canada, Denmark, France, Germany, Indonesia, Israel, Italy, Japan, Korea, Luxembourg, Singapore, Switzerland, The Netherlands, Turkey and United Kingdom.

The primary payload of PSLV-C23 consisted of the 714 kg French Earth Observation Satellite SPOT-7. Built by Airbus Defence and Space, a leading European space technology company, SPOT-7 is identical to SPOT-6 launched earlier by PSLV-C21 in September 2012.

Along with the primary payload, PSLV-C23 also carried and placed in orbit the 14 kg AISAT, a nano satellite of Germany, for global sea traffic monitoring. It has been fitted with an array of antennas that will receive transponder signals during sea rescue operations. Two other satellites were NLS7.1 (CAN-X4) and NLS7.2 (CAN-X5) of Canada each weighing 15 kg whose primary objective is researching whether satellites can be designed to facilitate sub-metre tracking error accuracy. And finally, PSLV-C23 also placed into orbit the 7 kg VELOX-1 of Singapore, which is a technology demonstrator for the Singapore-based Nanyang Technological University's Undergraduate Satellite Program, designed to provide students with real-world aerospace experience.

The textbook precision launch of the five satellites on board PSLV-C23 has once again reinforced ISRO's commanding position as a leading space agency in the world, making India proud.

Hasan Jawaid Khan

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