

## Two New Earth Observation Satellites Launched

Two new Earth observation satellites were launched last week from European Space Centre in Kourou in French Guyana, although you may only get to see the data from one. Ven $\mu$ s and OPTSAT-3000 were put into sun synchronous orbits by Arianespace via its Vega launch vehicle on the 1st August. Both satellites were built by Israel's state-owned Israel Aerospace Industries and carry instruments from Israel's Elbit Systems.

Ven $\mu$ s, or to give its full title of **Vegetation and Environment monitoring on a New MicroSatellite**, is a joint scientific collaboration between the Israeli Space Agency (ISA) and France's CNES space agency.

Ven $\mu$ s is focussed on environmental monitoring including climate, soil and topography. Its aim is to help improve the techniques and accuracy of global models, with a particular emphasis on understanding how environmental and human factors influence plant health. The satellite is equipped with the VEN $\mu$ S Superspectral Camera (VSSC) that uses 12 narrow spectral bands in the Visible Near Infrared (VNIR) spectrum - ranging from 420nm wavelength up to 910 nm wavelength – to capture 12 simultaneous overlapping high resolution images which are then combined into a single image. The camera uses a pushbroom collection technique and has a spatial resolution of 5.3m and a swath size of 27.56 km.

Ven $\mu$ s won't have full global coverage; instead there are 110 areas of interest around the world that includes forests, croplands and nature reserves. With a two day revisit time, during which time it completes 29 orbits of the planet. This means every thirtieth image will be collected over the same place, at the same time and with the same angle. This will provide high resolution imagery more frequently than is currently available from existing EO satellites. The consistency of the place, time and angle will help researchers better assess fine-scale changes on the land to improve our understanding of the:

- State of the soil,
- vegetation growth,
- detection of spreading disease or contamination,
- snow cover and glacial movements; and
- sediment movement in coastal estuaries

A specific software algorithm has been developed for the mission to work with the different wavelengths to remove clouds and aerosols from the satellite's imagery, giving clear images of the planet irrespective of atmospheric conditions.

The second satellite launched was the **OPTSAT-3000** which is an Italian controlled optical surveillance satellite, which will operate in conjunction with the COSMO-SkyMed radar satellites

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giving Italy's Ministry of Defence independent autonomous national Earth observation capability across optical and radar imagery.

This is a military satellite and so some of the details are difficult to verify. As mentioned earlier the instrument was made by Elbit systems, and the camera used usually offers a spatial resolution of around 0.5 m. However, it has been reported that the resolution will be much closer to 0.3m because the satellite is in a very low earth orbit of a 450 km.

OPTSAT-3000 will collect high resolution imaging of the Earth, it's not clear at this stage whether any of the imagery will be made available for commercial/scientific use or purchase, although it is worth noting that COSMOS-SkyMed images are sold.

Two more Earth observation satellites launched shows that our industry keeps on moving forward! We're really interested, and in OPTSAT's case hopeful, to see the imagery they produce.