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Issue 10

## KARI is the current lead of the International Charter 'Space and Major Disasters'

The 32nd Executive Secretariat and Board meeting of the International Charter 'Space and Major Disasters' was held at KARI (Korea Aerospace Research Institute) in Daejeon, South Korea from 14 to 17 October 2014.

More than 45 representatives from the Charter member agencies participated and discussed the latest Charter operational matters, which included the implementation of the new Charter operational system as well as the current progress of the Universal Access initiative.

In addition, an Emergency On-Call Officers meeting for eastern countries took place at KARI on 13th October 2015. The new Charter operating system was introduced and reviewed. The new system will help to make the Charter response to worldwide disasters more timely and efficient.

After the conclusion of the successful meeting, KARI has taken the lead agency role for a six-month period, ending in April 2015.



Charter Board and Executive Secretariat members at KARI in Daejeon, South Korea on 16 October 2014. @KARI

## 2014 - A busy year for the International Charter

In 2014, the International Charter 'Space and Major Disasters', has been activated for 41 disasters. This is slightly more than in the last three years, but less than in 2010 (see Fig. 1).

### Recent Activations

- [Villarrica Volcano in Chile](#)
- [Flood in Brazil](#)
- [Flood in Bolivia](#)
- [Flood in Australia following Cyclone Lam](#)
- [Flood in Australia following Cyclone Marcia](#)

### Charter Members

- [European Space Agency \(ESA\)](#)
- [Centre national d'études spatiales \(CNES\)](#)
- [Canadian Space Agency \(CSA\)](#)
- [Indian Space Research Organisation \(ISRO\)](#)
- [National Oceanic and Atmospheric Administration \(NOAA\)](#)
- [Argentina's Comisión Nacional de Actividades Espaciales \(CONAE\)](#)
- [Japan Aerospace Exploration Agency \(JAXA\)](#)
- [US Geological Survey \(USGS\)](#)
- [DMC International Imaging \(DMC\)](#)
- [China National Space Administration \(CNSA\)](#)
- [German Aerospace Center \(DLR\)](#)
- [Korea Aerospace Research Institute \(KARI\)](#)
- [National Institute for Space Research \(INPE\)](#)
- [European Organisation for the Exploitation of Meteorological Satellites \(EUMETSAT\)](#)
- [The Russian Federal Space Agency \(ROSCOSMOS\)](#)

Bringing together new and efficient space technologies to support disaster management



Fig. 1: Number of Activations

The 41 activations in 2014 distributed among the following types of disasters and geographical distribution:

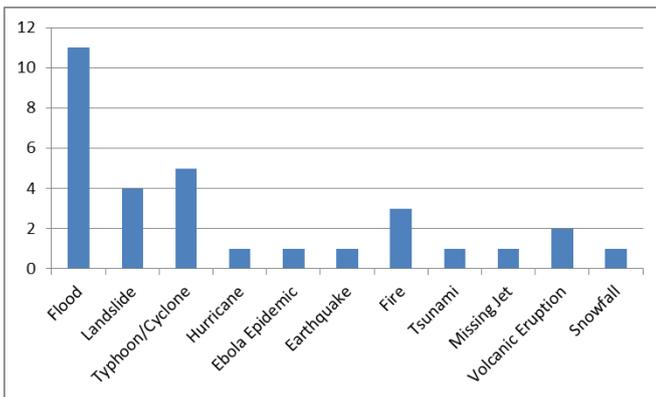


Fig. 2: Types of disasters

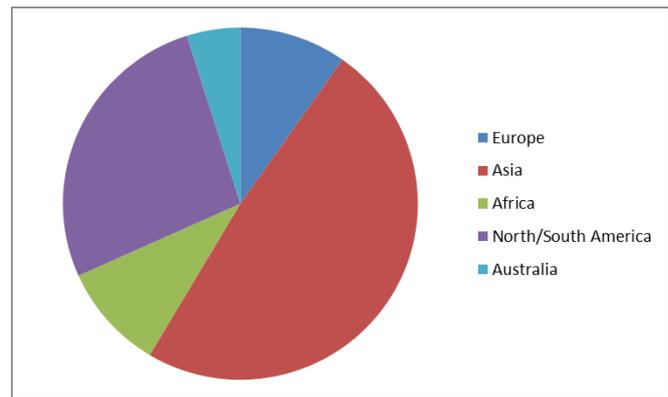


Fig. 3: Geographical distribution

Two very special disasters were covered by the Charter in 2014: the disappearance of an airplane from Malaysia Airlines in March and the Ebola Epidemic in West Africa in the second half of 2014. In the first case, data of optical and radar satellites of Charter member agencies were acquired and analyzed in order to find floating debris or oil spills in the ocean in the area where the plane possibly crashed. Unfortunately this was not successful. In the case of the Ebola epidemic, Charter data was used to provide information about infrastructure to aid teams active in the areas infested by Ebola.

As in the last 15 years the Charter will continue to provide EO satellite data to help quickly and efficiently in case of disasters.

## RapidEye Satellite contributes after fires in the Dominican Republic

Recently, the optical RapidEye constellation of five satellites was fully integrated in the operational workflow of the Charter by the German Aerospace Center DLR. This privately owned system delivers images with a spatial resolution of 6 meters and proved particularly helpful for the observation of large fires.

A fire disaster in the Dominican Republic led to a Charter activation in July 2014, and maps based on Landsat and RapidEye satellites were delivered by the Charter.

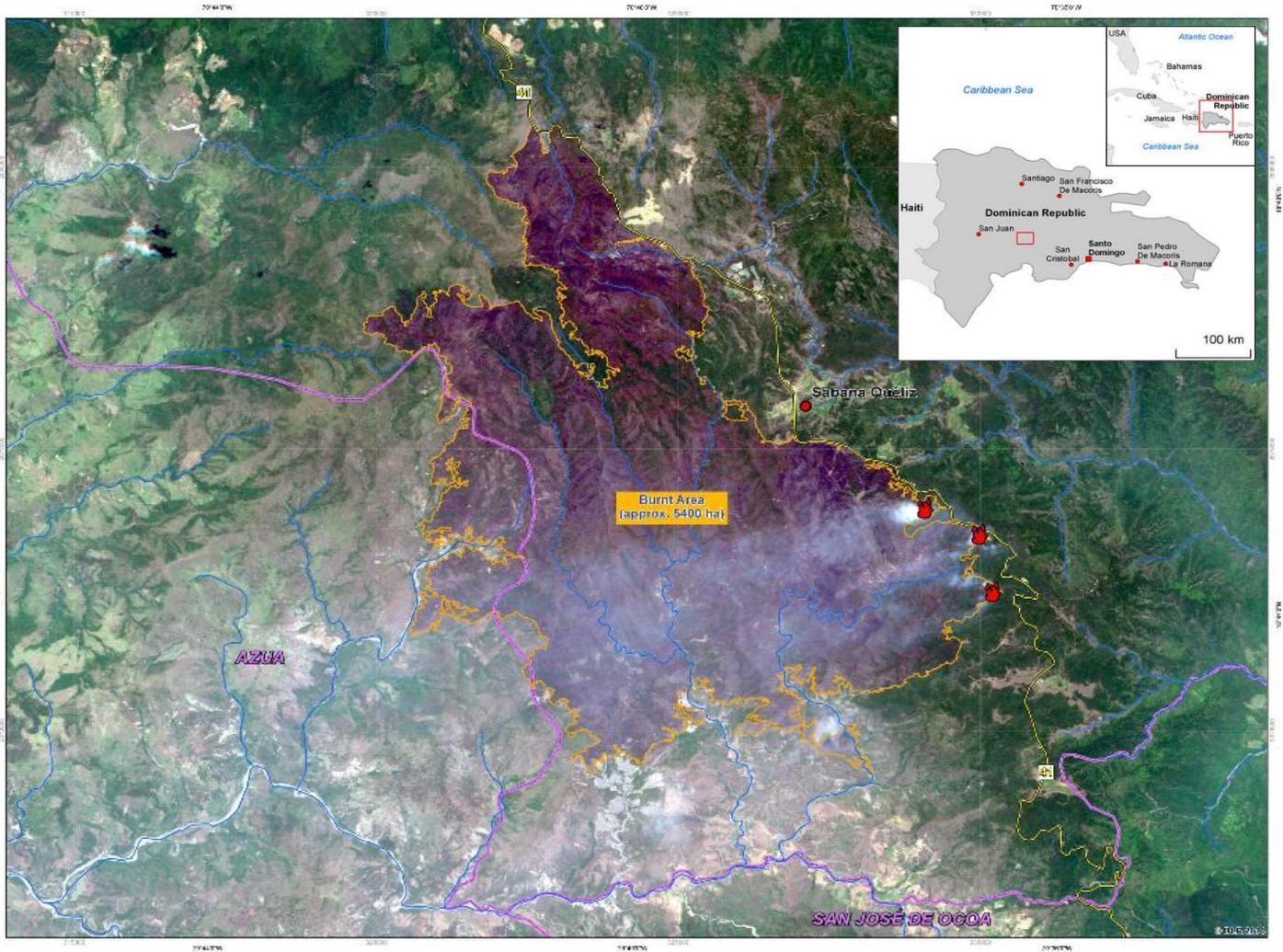


Fig. 4: Map produced by DLR/ZKI. The burnt area extent was derived by visual interpretation of RapidEye imagery acquired on August 2, 2014. The analysis has shown that approximately 5,400 hectares of forest were burnt

Since July 20, 2014 several forest fires occurred in the Valle Nuevo National Park, La Vega Province, Dominican Republic. Thousands of hectares of pine and other ancient timber forest have been devastated. Around 700 firefighters were in action to get the forest fire under control.

## JAXA to provide images from its new EO satellite

JAXA began providing Earth observation data acquired by its new satellite “DAICHI-2”, also called “ALOS (Advanced Land Observing Satellite) -2”. DAICHI-2 was launched on 24th May, 2014 from Tanegashima Space Center.

The predecessor of “DAICHI-2”, “DAICHI” (ALOS) was launched in January, 2006 and continued its mission till May, 2011. “DAICHI” acquired about 6.5 million images around the world and JAXA provided many of them to disaster management communities including the International Charter and Sentinel Asia.

Although its predecessor was equipped with both optical and radar sensors, the payload of “DAICHI-2” is only the L-band Synthetic Aperture Radar called “PALSAR-2”. Unlike optical sensors, radar sensors can penetrate clouds so it is expected that observation requests for “DAICHI-2” will be strong.

“DAICHI-2” has three observation modes. The highest resolution mode is 1~3m Spotlight mode and the widest swath is 350km or 490km from ScanSAR mode. JAXA will continue to contribute to the International Charter mission with this new satellite.

For more detailed information of “DAICHI-2”, please refer to the following page on the JAXA website:

<http://global.jaxa.jp/projects/sat/alos2/index.html>

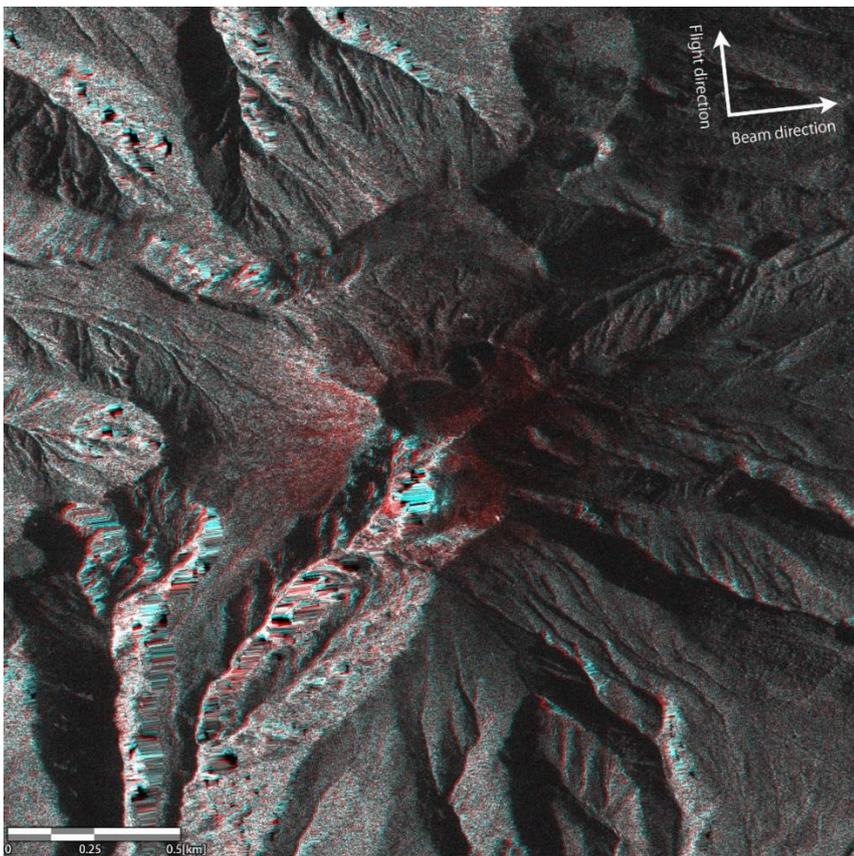
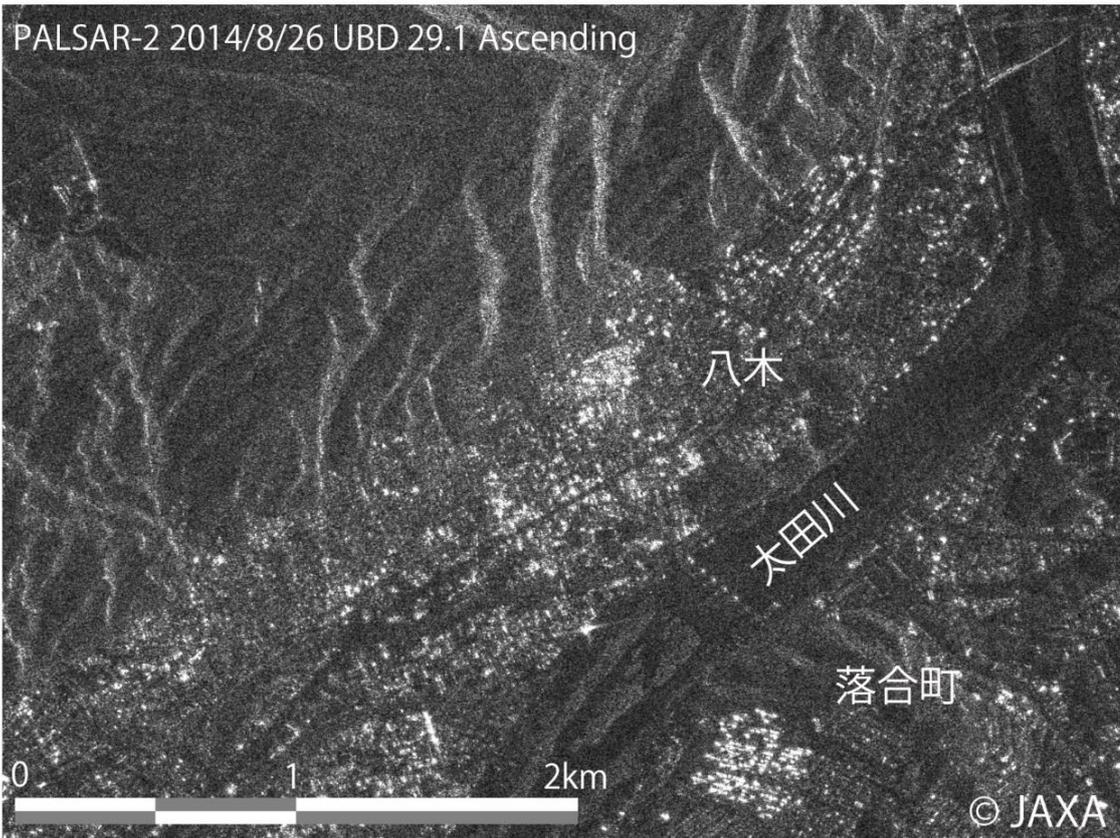


Fig. 5: Color composite image of Mt. Ontake Volcano, August 18 (before eruption, assigned to red) and September 29 (after eruption assigned to cyan) in 2014.

PALSAR-2 2014/8/26 UBD 29.1 Ascending



PALSAR 2010/9/14 FBS 34.3 Descending

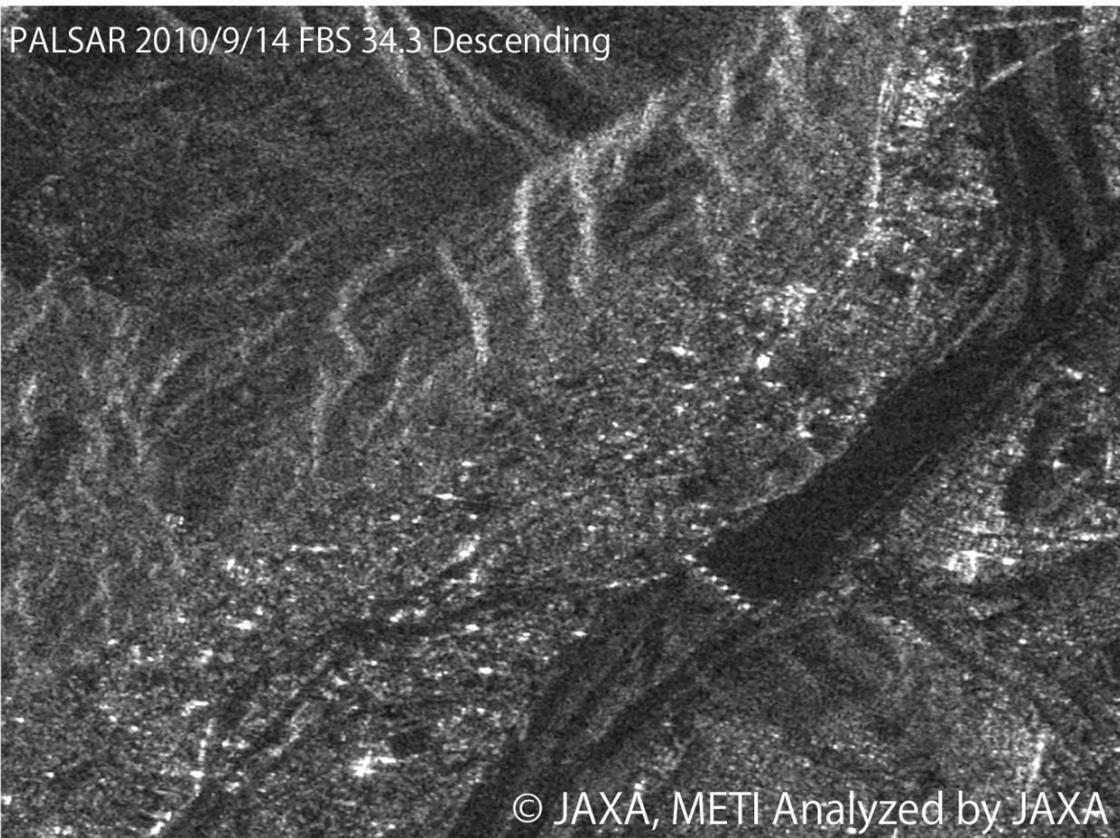


Fig. 6: PALSAR-2 image (upper, after mudslide) and PALSAR image (lower, before mudslide) observed in Asaminami-ku, Hiroshima-city mudslide in August, 2014.

## Sentinel-2: Colour vision for Copernicus

Sentinel-2A will soon be shipped to Europe's Spaceport in French Guiana for launch this spring. Carrying a novel high-resolution multispectral imager, this new satellite is set to open a new chapter in the ability to monitor Earth's vegetation and track changes in the way land is used.



Fig. 7: Sentinel-2 @ ESA/ATG Medialab

As its name suggests, Sentinel-2A is the second of ESA's fleet of Sentinel satellites dedicated to Europe's Copernicus programme – the largest environmental monitoring programme in the world. Importantly, data from the Sentinels are open to users worldwide and are available free of charge.

Sentinel-2A, which follows the Sentinel-1A radar satellite launched in April 2014, carries a high-resolution multispectral imager with 13 spectral bands. The mission is based on a constellation of two identical satellites so Sentinel-2B will join Sentinel-2A in orbit in 2016. Flying 180° apart, they will cover all Earth's land surfaces, large islands, inland and coastal waters between 84°N and 56°S every five days.

The combination of high resolution, novel spectral capabilities, a swath width of 290 km and frequent revisit times will offer high resolution data for the Charter applications as well as detailed views of Earth's changing lands.

Since one of today's biggest challenges is to ensure that land is used sustainably, while meeting the food and wood demands of a growing global population, Sentinel-2 will offer important information that can be used to assess, for example, vegetation health so that informed decisions can be made – whether they are about addressing climate change or deciding how much water and fertiliser crops need for a maximum harvest.

Sentinel-2 is able to distinguish between different crop types and will deliver timely data on numerous plant indices such as leaf area index, leaf chlorophyll content and leaf water content. All of these are essential to accurately monitor plant growth. This kind of information is important for precision farming and helping farmers decide how best to nurture their crops and predict yield.

Information from Sentinel-2 will not only be used to help improve agricultural practices and map changes in land cover, but will also monitor the world's forests and detect pollution in lakes and coastal waters.

Sentinel-2's frequent revisit time is also key to being able to monitor floods, volcanic eruptions and landslides. This allows the mission to contribute to disaster mapping and help humanitarian relief efforts.

## KOMPSAT- 3A getting ready for launch in March 2015

A new Korean earth observation satellite, KOMPSAT-3A has been developed and is now ready for launch scheduled in March 2015 from Yasni, Russia, on a Dnepr rocket. This satellite mission aims to provide high-resolution infrared (IR) and electro-optical (EO) images. The spatial resolution is 0.55 m in the panchromatic band, 2.2 m for the multispectral bands and 5.5 m in the infrared band. The swath width is 12 km. The KOMPSAT-3A will operate in a sun-synchronous orbit at an altitude of 528 km for 4 years.

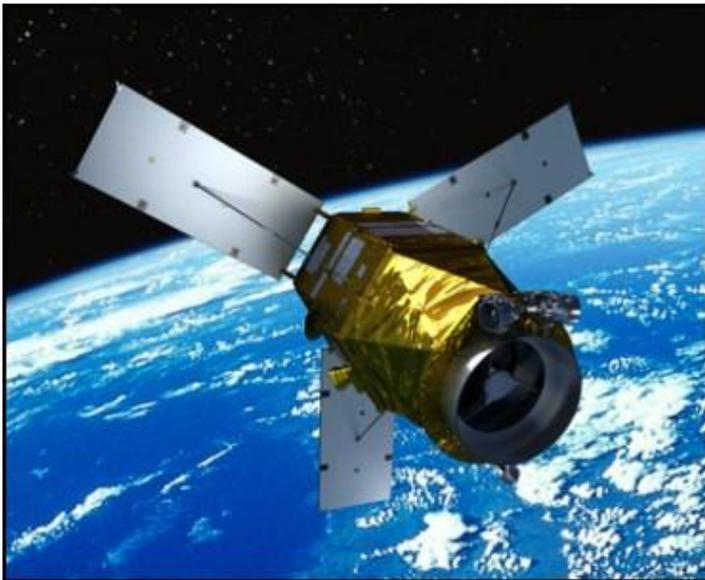


Fig. 8: KOMPSAT-3A @KARI

With its successful launch it is expected to complement the current KOMPSAT (Korea Multi-Purpose SATellite) missions and to enhance civilian applications such as terrestrial change detection, environmental monitoring, and disaster management. The KOMPSAT missions currently in operation are composed of very high resolution multispectral satellites (KOMPSAT-2 and 3) and the first Korean synthetic aperture radar satellite with high resolution mode (KOMPSAT-5).

## SAR Remote Sensing Education Website

Do you want to learn about Radar Remote Sensing? Then you should visit a new web platform for radar remote sensing education, which was built-up in a project funded by DLR. There are 62 units altogether, and everyone can register and learn more about SAR-based remote sensing.

Currently operating radar satellites contributing to the Charter are the Canadian Radarsat-2, the Indian RiSat-2, the German TerraSAR-X and TanDEM-X, the European Sentinel-1 since 2014, and very soon the Japanese DAICHI-2 (ALOS-2).



For more Information: <https://saredu.dlr.de/>