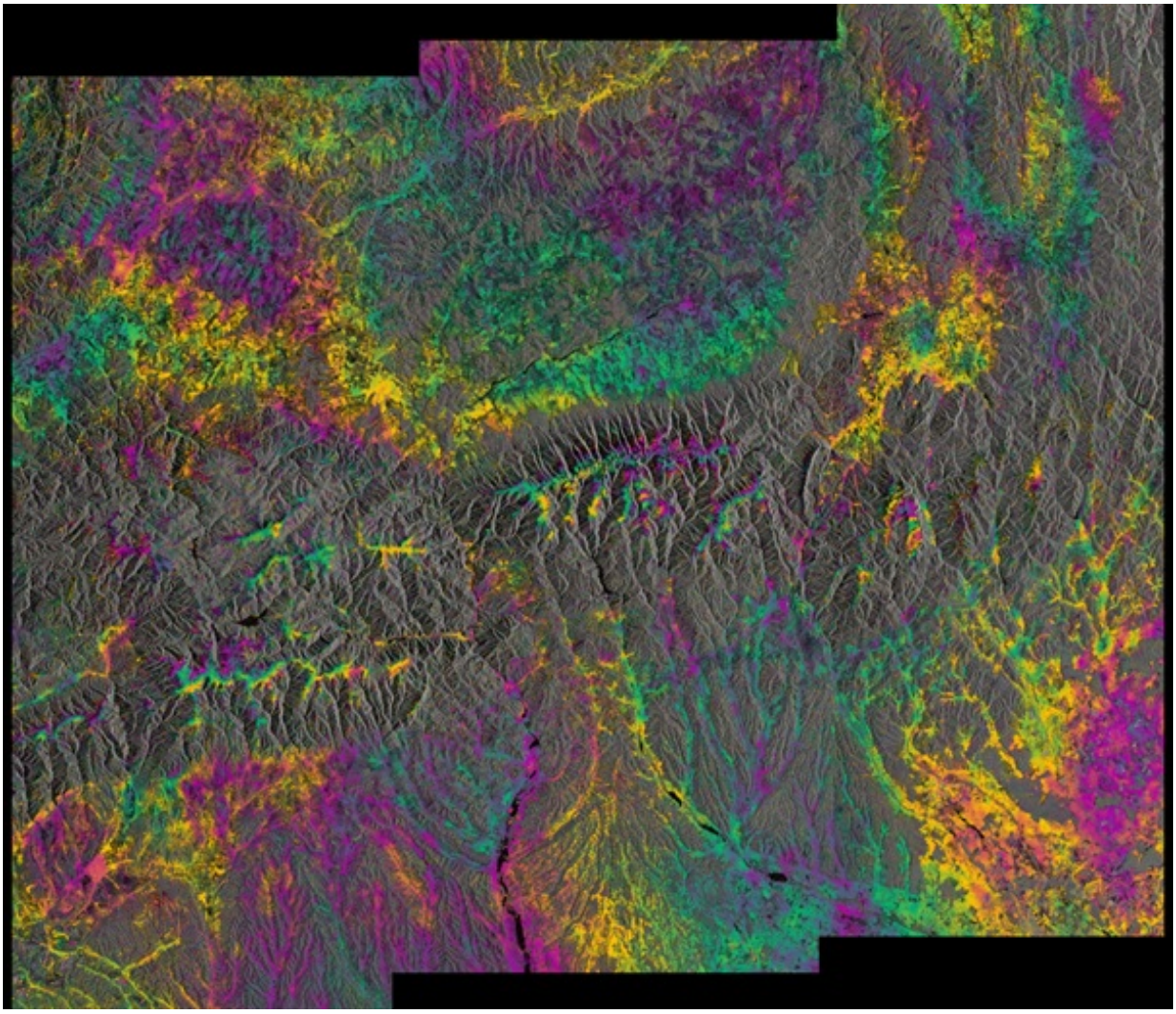
Sentinel-1 satellites combine radar vision

June 30 2016



This ‘interferogram’ combines a Sentinel-1A radar scan from 9 June 2016 over southern Romania with a Sentinel-1B acquisition from 15 June over the same area – shortly before Sentinel-1B reached its designated orbit. Bucharest is near the lower right corner of the image. The colour pattern is related to local terrain topography. Credit: Contains modified Copernicus Sentinel data

(2016)/ESA/Norut

The twin Sentinel-1 satellites have – for the first time – combined to show their capability for revealing even small deformations in Earth's surface.

Following its orbital manoeuvres, the recently launched Sentinel-1B satellite reached its designated orbit position on 15 June.

The satellite is now orbiting Earth 180° apart from its twin, Sentinel-1A, at an altitude of almost 700 km. With both satellites finally in the same orbit, together they can cover the whole globe every six days.

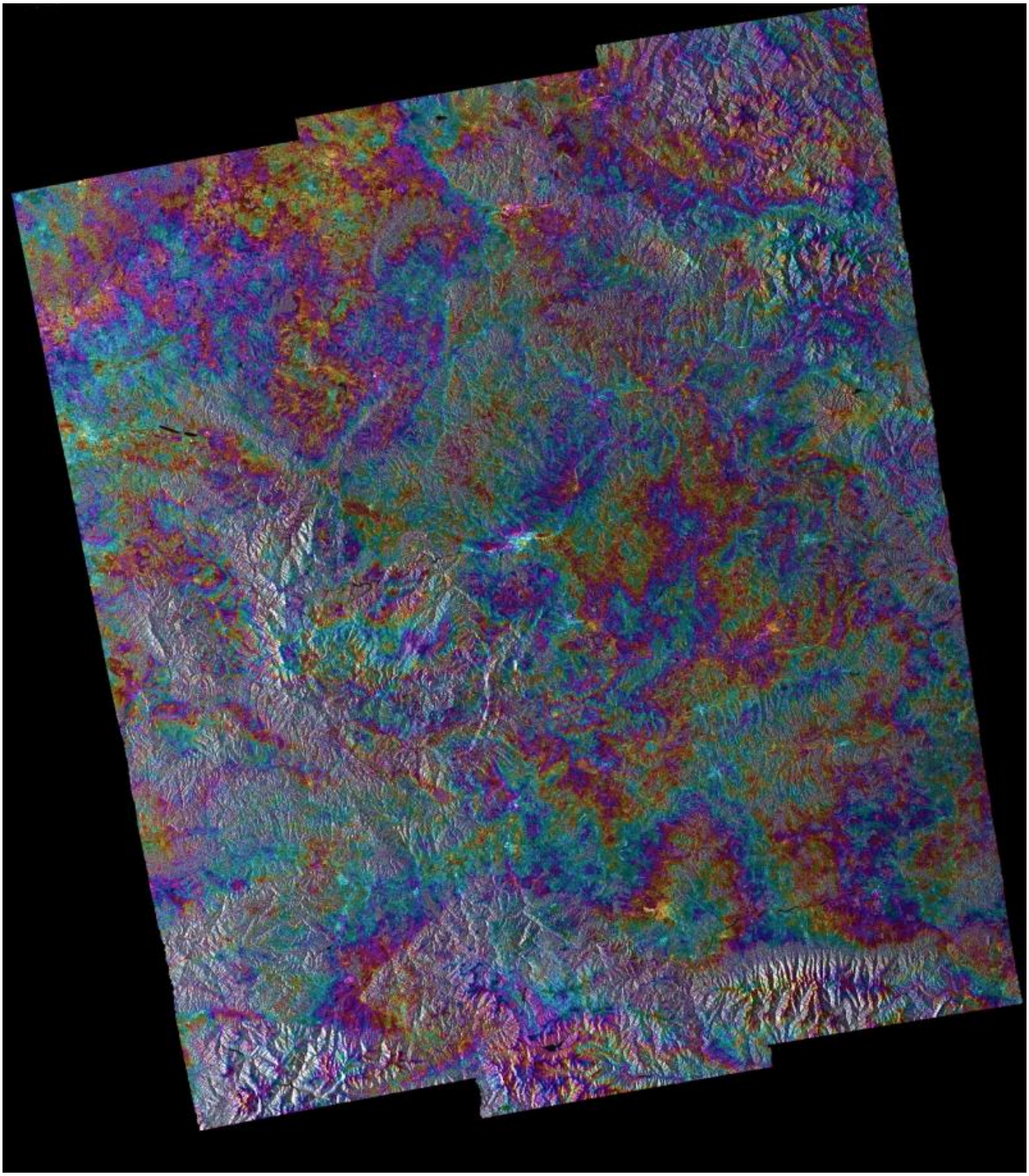
The two-satellite 'radar vision' mission for Europe's Copernicus programme carries an advanced radar to provide an all-weather, day-and-night supply of imagery of Earth's surface.

It has now been demonstrated that future images acquired by the pair can be merged to detect slight changes occurring between scans.

This technique is particularly useful for generating accurate maps of surface deformation over wide areas, such as those caused by tectonic processes, volcanic activities or landslides.

It is also an ideal tool for monitoring glacier flow and changes in Arctic and Antarctic ice shelves.

Sentinel-1's first such paired 'interferogram' combined a Sentinel-1A scan over southern Romania on 9 June with a Sentinel-1B acquisition over the same area just one day before reaching its target orbit position.



This ‘interferogram’ combines a Sentinel-1A radar scan from 10 June 2016 over northwestern Romania with a Sentinel-1B acquisition from 16 June over the same area – shortly before Sentinel-1B reached its designated orbit. The city of Cluj-Napoca is at the centre of the image. The colour pattern is related to local

terrain topography. Credit: Contains modified Copernicus Sentinel data (2016)/ESA/DLR

Another interferogram over northwest Romania was produced shortly after Sentinel-1B reached its final orbit.

The rainbow-coloured patterns are related to topography, and they demonstrate that the two satellites' identical radars are accurately synchronised, pointing in the same direction and that the satellites are in their correct orbits.

Once commissioning is completed in mid-September, the pair will be ready to deliver data for the systematic and routine monitoring of Earth surface deformation and ice dynamics.

"After the great success of generating the first radar image less than three days after liftoff, I am very happy to report another outstanding success as it is the generation of the first interferograms with Sentinel-1B on the same day that we reached the orbital position, 180° apart from Sentinel-1A," said ESA's Sentinel-1 project manager, Ramón Torres.

"It is of paramount importance to the mission that we have demonstrated, at the first try, that the two Sentinel-1 satellites work very well together."

Sentinel-1, the first in the family of Copernicus satellites, is used to monitor many aspects of our environment, from detecting and tracking oil spills and mapping sea ice to monitoring movement in land surfaces and mapping changes in the way land is used. It also plays a crucial role in providing timely information to help respond to natural disasters and assist humanitarian relief efforts. Credit: ESA/ATG medialab

Provided by European Space Agency