European Commission

European Space Agency

sentinel-1

→ RADAR VISION FOR COPERNICUS

Satellites to serve

The Sentinels are a new fleet of satellites designed to deliver the wealth of data and imagery that are central to Europe's ambitious Copernicus programme. By offering a set of key information services for a broad range of applications, this innovative global monitoring programme makes a step change in the way we manage our environment, understand and tackle the effects of climate change, and safeguard everyday lives.

Taking the lead

Sentinel-1A, the first in the family of Copernicus satellites, was launched in April 2014. It marked a new paradigm in Earth observation focusing on operational missions to support users for decades to come. With the mission designed as a two-satellite constellation, Sentinel-1A was joined by its identical twin, Sentinel-1B, in April 2016. By orbiting 180° apart, global coverage and data delivery are optimised for the Copernicus services.

Delivering timely information for numerous services, from monitoring ice in polar oceans to tracking land subsidence, this mission is playing a key role in the largest Earth observation programme ever conceived.

Radar vision

As an advanced radar mission, Sentinel-1 can image the surface of Earth through cloud and rain and regardless of whether it is day or night. This makes it an ideal mission, for example, for monitoring the polar regions, which are in darkness during the winter months and for monitoring tropical forests, which are typically shrouded by cloud.

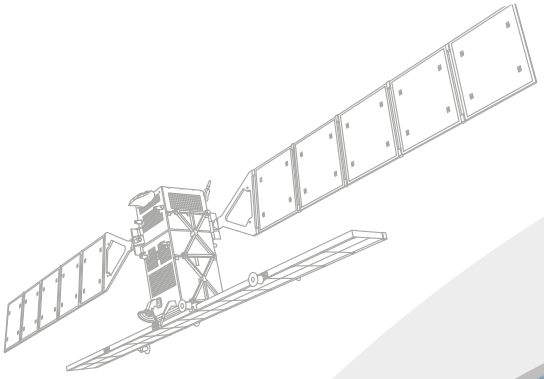
Over oceans and seas, the mission provides imagery to generate timely maps of sea-ice conditions for safe passage, to detect and track oil spills and to provide information on wind, waves and currents. Over land, Sentinel-1's systematic observations are used, for example, to track changes in the way the land is used and to monitor ground movement with exceptional accuracy. Moreover, this new mission is designed specifically for fast response to aid emergencies and disasters such as flooding and earthquakes.

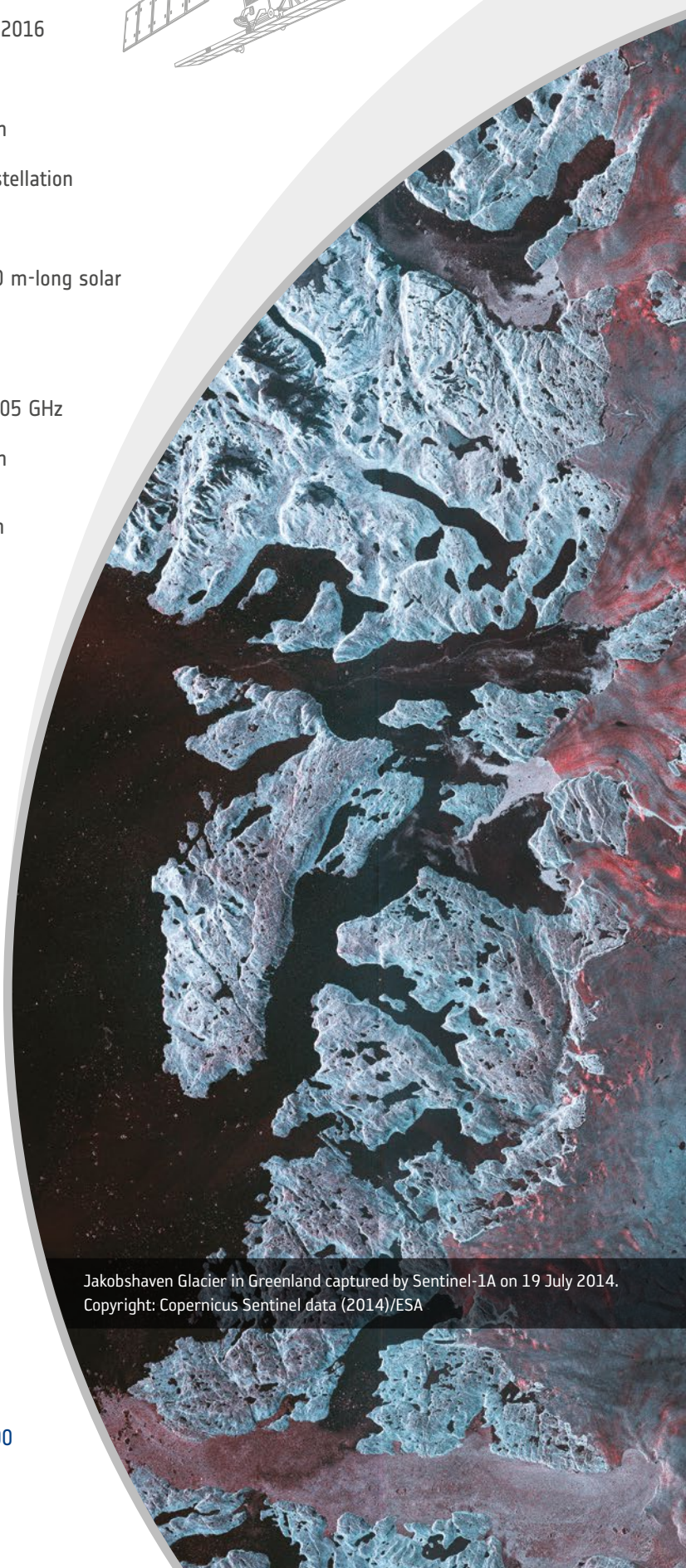
Teamwork

The Sentinel-1 mission is the result of close collaboration between ESA, the European Commission, industry, service providers and data users. Designed and built by a consortium of around 60 companies led by Thales Alenia Space and Airbus Defence and Space, it is an outstanding example of Europe's technological excellence.

Facts and figures

Launch	Sentinel-1A April 2014, Sentinel-1B in April 2016
Launcher	Soyuz rocket from Kourou, French Guiana
Orbit	Polar, Sun-synchronous at altitude of 693 km
Revisit time	Six days (at equator) from two-satellite constellation
Life	Minimum of seven years
Satellite	2.8 m long, 2.5 m wide, 4 m high with 2×10 m-long solar arrays and a 12 m-long radar antenna
Mass	2300 kg (including 130 kg fuel)
Instrument	C-band synthetic aperture radar (SAR) at 5.405 GHz
Operational modes	Interferometric wide-swath mode at 250 km and 5×20 m spatial resolution Wave-mode images of 20×20 km and 5×5 m spatial resolution (at 100 km intervals) Strip map mode at 80 km swath and 5×5 m spatial resolution Extra wide-swath mode of 400 km and 20×40 m spatial resolution
Receiving stations	SAR data: to ground stations in Svalbard Norway, Matera Italy, Maspalomas Spain, and Inuvik Canada, and via laser link through EDRS. Telemetry data: transmitted to and from Kiruna Sweden
Main applications	Monitoring sea ice & icebergs, oil spills, marine winds, waves & currents, land-use change, land deformation among others, and to respond to emergencies such as floods and earthquakes
Mission	Developed, operated and managed by various ESA establishments
Funding	ESA Member States and the European Union
Prime contractors	Thales Alenia Space for the satellite; Airbus Defence and Space for the SAR
Data access	sentinels.copernicus.eu





Jakobshaven Glacier in Greenland captured by Sentinel-1A on 19 July 2014.
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