ESA GRSST Welcome

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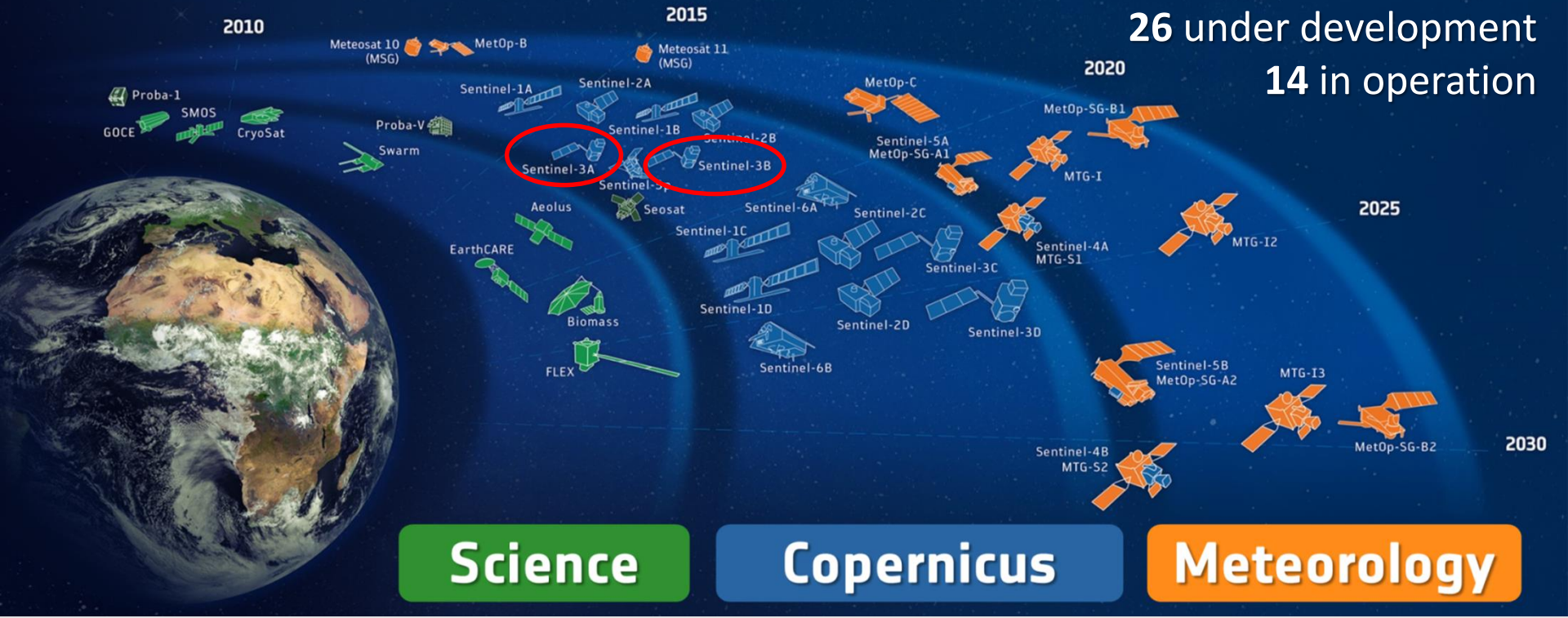
ESA-DEVELOPED EARTH OBSERVATION MISSIONS

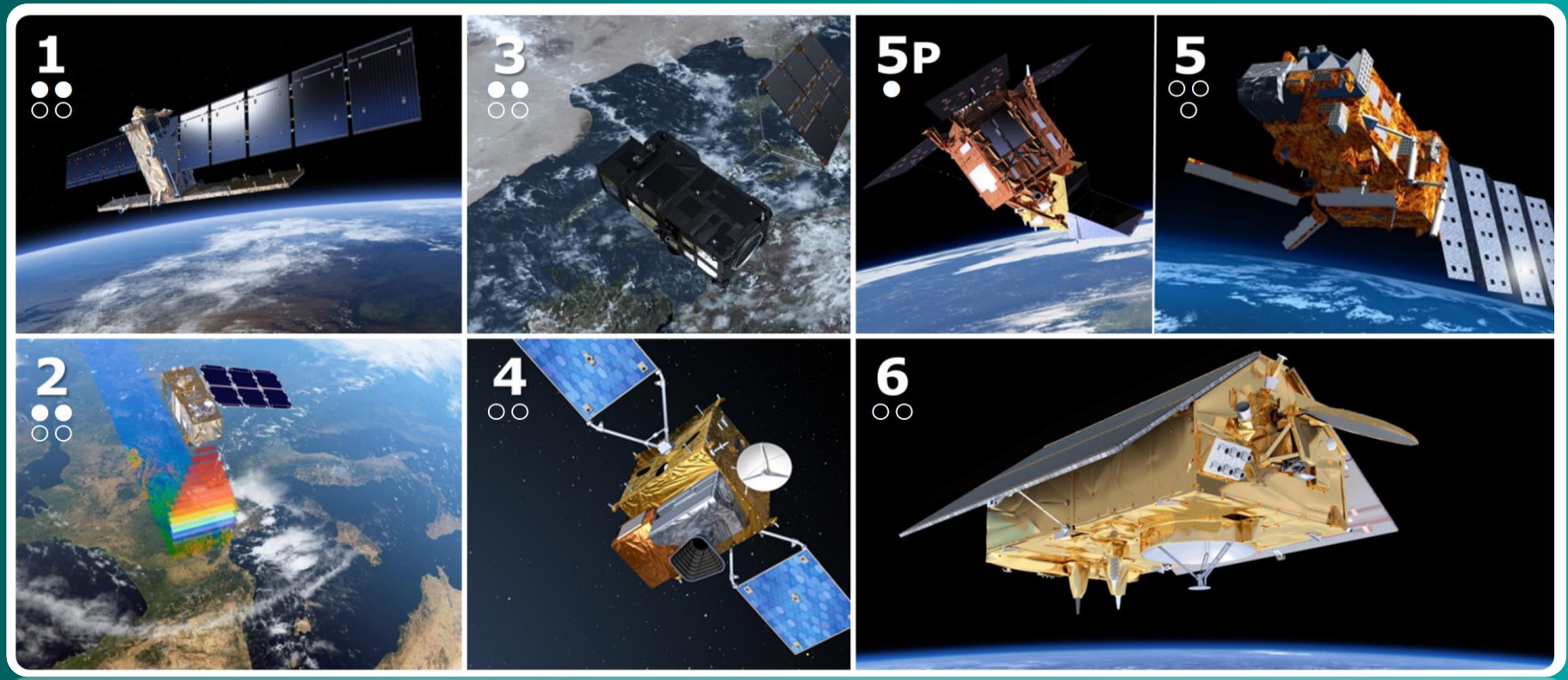
Satellites
26 under development
14 in operation



Science **Copernicus** **Meteorology**

The Big Data Revolution

Copernicus is the largest producer of EO data in the world



Copernicus Sentinel Status

S-1

Radar

A	3 Apr. 2014
B	25 Apr. 2016
C	2022/23
D	> 2022/23

S-2

High Res. Optical

A	23 Jun. 2015
B	6 Mar. 2017
C	2022/23
D	> 2022/23

S-3

Medium Res. Optical & Altimetry

A	16 Feb. 2016
B	25 Apr. 2018
C	2023
D	> 2023

S-4

Atmospheric Chemistry (GEO)

A	2022
B	2027

S-5P

Atmospheric Chemistry (LEO)

A	13 Oct. 2017

S-5

Atmospheric Chemistry (LEO)

A	2021
B	2027
C	> 2027

S-6

Altimetry

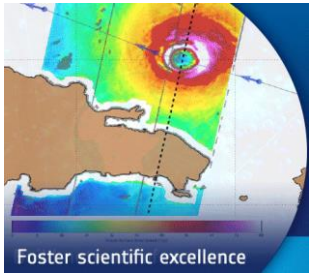
A	2020
B	2025

EO Science for Society

#EO4society

OBJECTIVES

- Foster scientific excellence
- Pioneer new EO applications
- Stimulate downstream industry growth
- Support international responses to global societal challenges
- Develop platforms technical capabilities
- Build network of resources



#EO4society

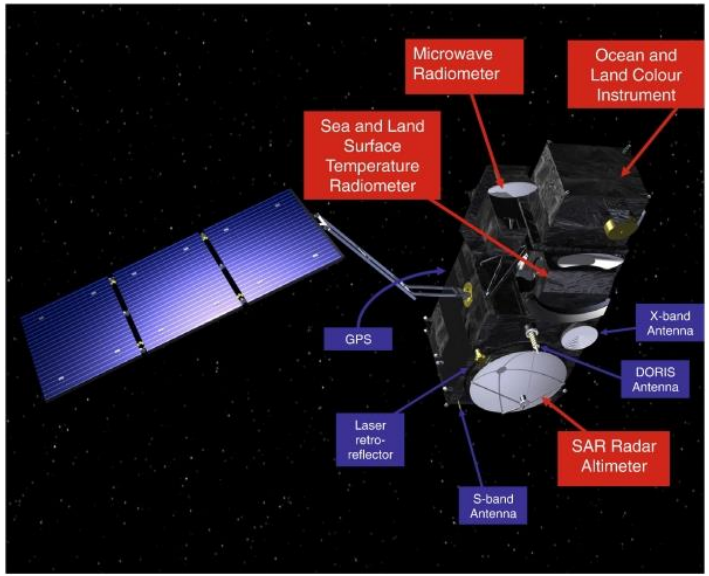
Consultations

Sentinel-3
Mission Overview

- **Operational mission in high-inclination, low Earth orbit**
- **Full performance achieved with 2 satellites in orbit (Sentinel-3A,-3B)**

Optical Mission Payload providing

- Sea and land color data, through OLCI (Ocean & Land Color Instrument)
- Sea and land surface temperature, through the SLSTR (Sea & Land Surface Temperature Radiometer)



Topography Mission Payload Providing

- **Sea surface topography data**, through a Topo P/L including a **Ku-/C-band Synthetic Aperture Radar Altimeter (SRAL),** a bi-frequency **MicroWave Radiometer (MWR),** and a **Precise Orbit Determination (POD)** including
  - **GNSS Receiver**
  - **DORIS**
  - **Laser Retro-Reflector**

In addition, the payload design will allow

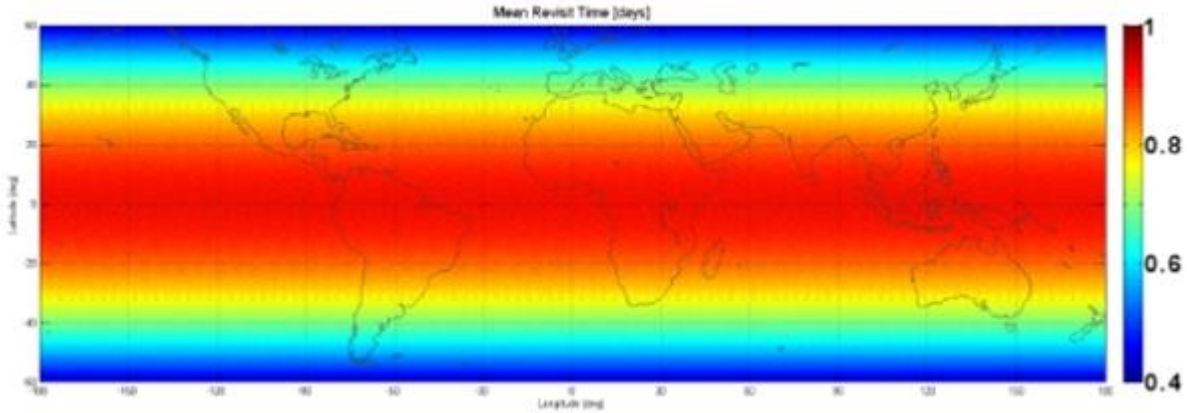
- **Data continuity of the Vegetation instrument (on SPOT4/5)**
- **Enhanced fire monitoring capabilities, river and lake height, atmospheric products**

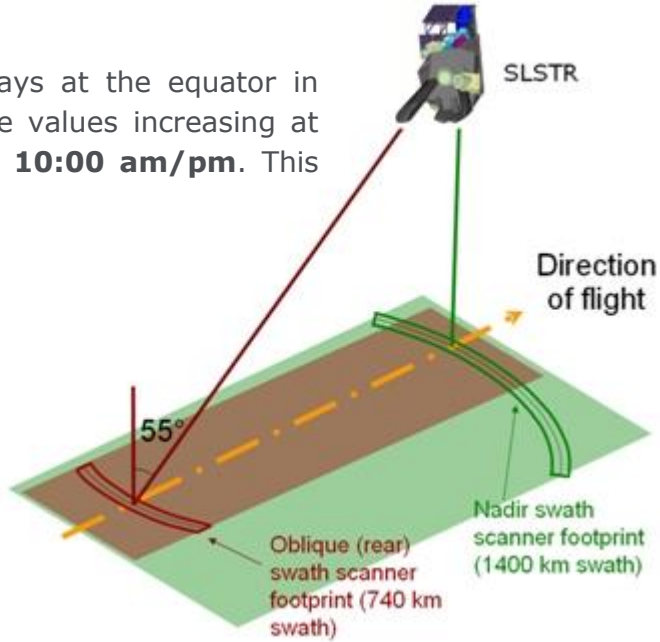
Sentinel-3
SLSTR Overview

The **SLSTR** (Sea & Land Surface Temperature Radiometer) uses two independent scan chains each including a separate scan mirror. While more complex than the single scan system employed by the ATSR instrument, this configuration especially increases instrument swath coverage.

- Oblique view swath: ~ 740 km
- Nadir view swath: ~ 1400 km.

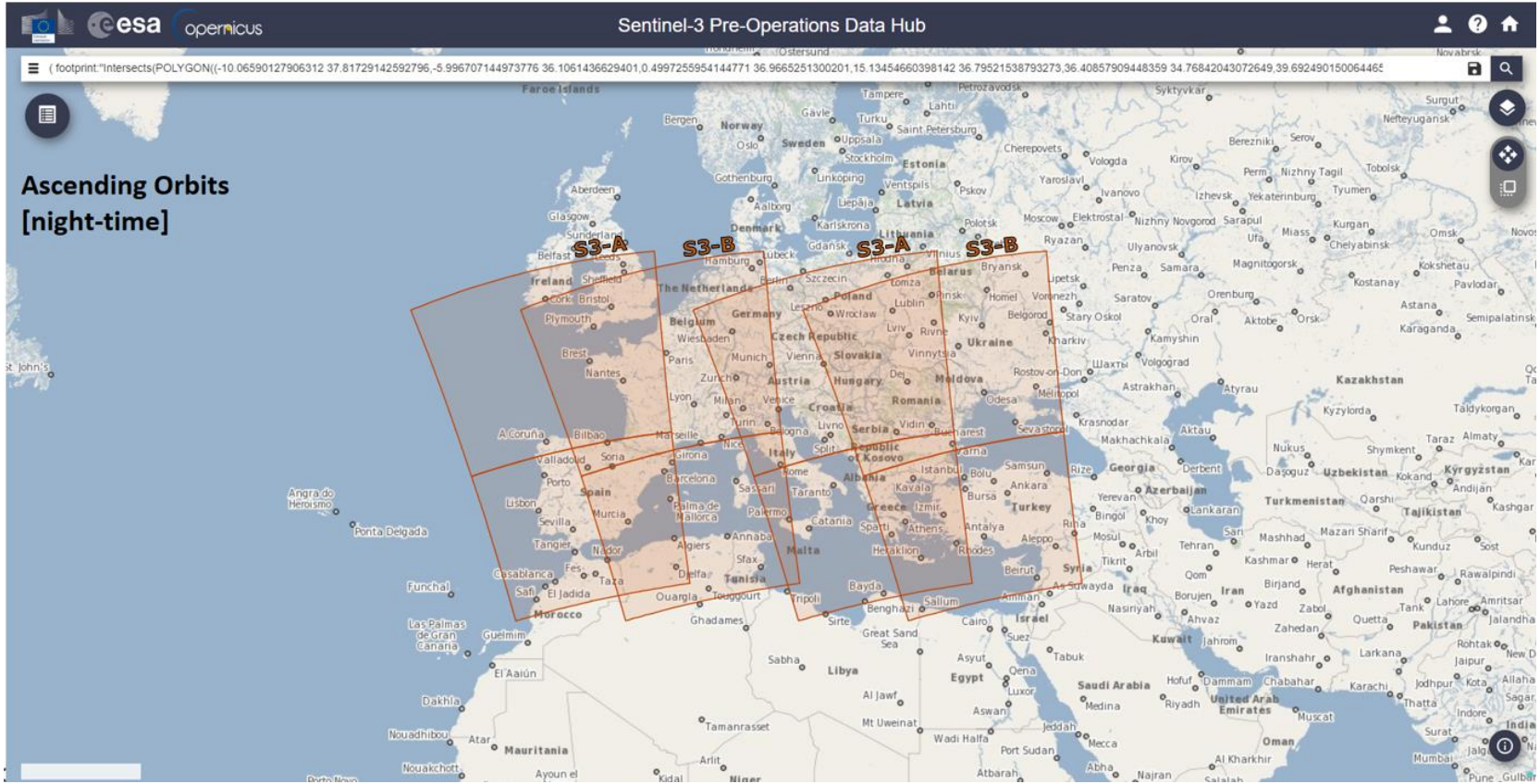
The mean global coverage revisit time for dual view SLSTR observations is 0.9 days at the equator in constellation with a 180° in-plane separation between the two spacecraft with these values increasing at higher latitudes due to orbital convergence, with a local equatorial crossing time of **10:00 am/pm**. This satellite orbit provides a 27-day repeat.





Sentinel-3

SLSTR Daily Coverage over Southern Europe [1st March 2019]



Sentinel-3
SLSTR Spectral Bands

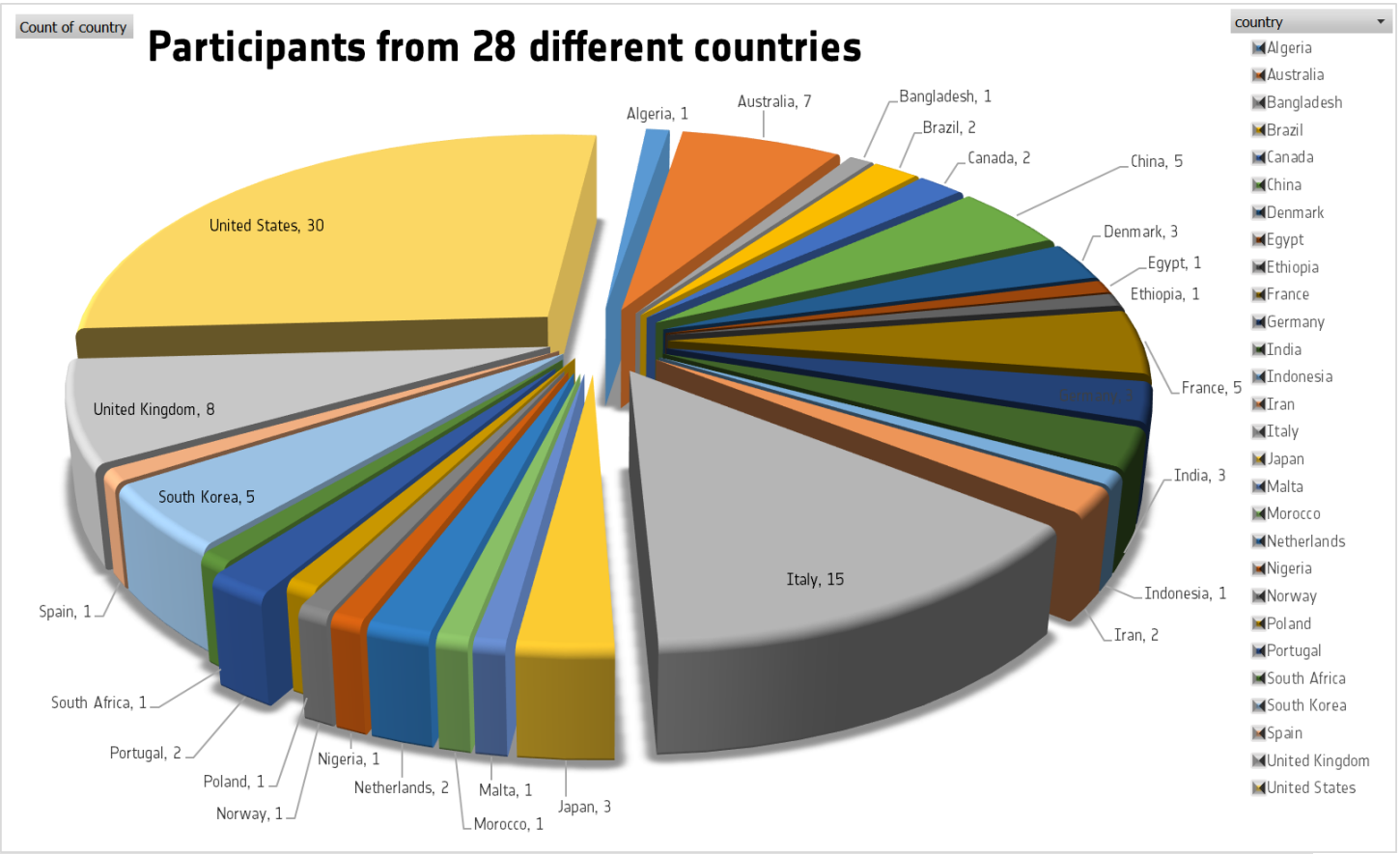
Band	Central Wavelength (nm)	Bandwidth (nm)	Function	Comments		Resolution (metres)
S1	554.27	19.26	Cloud screening, vegetation monitoring, aerosol	VNIR	Solar Reflectance Bands	500
S2	659.47	19.25	NDVI, vegetation monitoring, aerosol			
S3	868.00	20.60	NDVI, cloud flagging,Pixel co-registration			
S4	1374.80	20.80	Cirrus detection over land	SWIR		
S5	1613.40	60.68	loud clearing, ice, snow,vegetation monitoring			
S6	2255.70	50.15	Vegetation state and cloud clearing			
S7	3742.00	398.00	SST, LST, Active fire	Thermal IR Ambient bands (200 K -320 K)		1000
S8	10854.00	776.00	SST, LST, Active fire			
S9	12022.50	905.00	SST, LST			
F1	3742.00	398.00	Active fire	Thermal IR fire emission bands		
F2	10854.00	776.00	Active fire			

An on-ground resolution of 0.5 km at nadir for all VIS and SWIR channels. Radiance measurements from these channels are used for both land and clouds daytime observations.

Two SWIR channels (at wavelengths of 2.25 µm and 1.375 µm) to allow improved cloud and aerosol detection to give more accurate SST/LST retrievals.

Two dedicated channels (F1 and F2) for fire and high temperature event monitoring at 1 km resolution (by extending the dynamic range of the 3.7 µm channel and including dedicated detectors at 10.8 µm that are capable of detecting fires up to ~650 K without saturation).

GHRSST-XX Participant Statistics



26 Oral presentations

61 Interactive presentations