



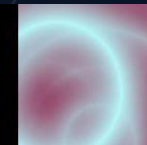
School of Aerospace  
Engineering

### Earth Observation Satellite Images Application Lab.

The laboratory is focused on the development of innovative applications of satellite/aerial optical (multi- and hyper-spectral) and SAR imagery covering a wide range of fields of interest, as fire monitoring, volcanic eruptions and ash cloud monitoring, oil spill monitoring, environmental monitoring including the development of applications related to security. The laboratory is oriented in particular to the development of automatic applications based on real-time approaches.

[eosial.psm.uniroma1.it](http://eosial.psm.uniroma1.it)

**EOSIAL**  
Earth Observation Satellite Images Application Lab.



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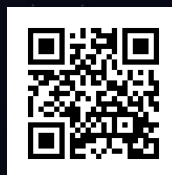


Photo:ESA



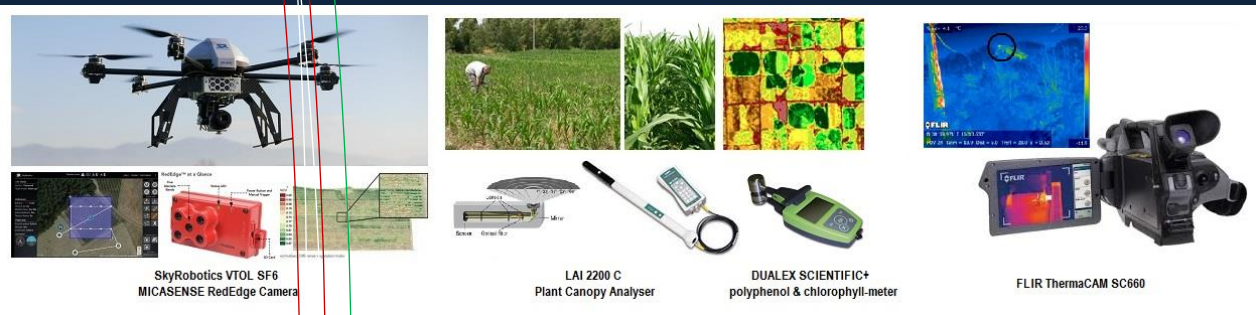
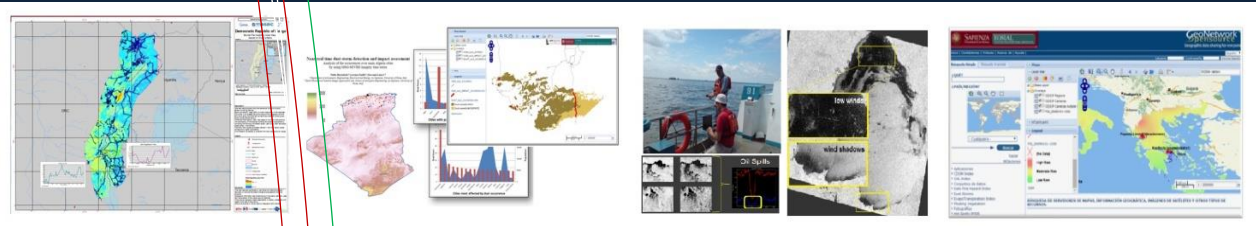
# EOSIAL

## EARTH OBSERVATION SATELLITE IMAGES APPLICATION LABORATORY

The Lab of remote sensing satellite images applications is dedicated to develop innovative application through the use of optical remote sensing data (multi- and hyper-spectral) and SAR, integrated with GIS analysis. The areas of interest include: the monitoring of fires, monitoring of volcanic eruptions, the study of oil spills, monitoring of agricultural areas and precision agriculture, the development of applications related to safety issues (borders

permeability, monitoring of refugee camps) and disaster management (dust storm, damage assessment, early warning, etc.).

The activities of the laboratory is oriented, in particular, to the development of automatic monitoring applications in 'real-time'. The laboratory is equipped with the software and hardware tools necessary for satellite images processing and an extensive archive of satellite images including images in low, high and very high spatial resolution, optical and radar.



### PROJECTS

- ALOS-2 RA.
- CADMO.
- DDCVE.
- EFFMIS.
- EVOSS.
- GMOS.
- MUSCOS.
- ODS3F.
- OSD-TERRASAR.
- PREFER.
- POST FIRE MONITORING CSK.
- SAP4PRISMA.
- SBAM.
- SIGRI.
- SINO-ITALIAN.

## flexible solutions for remote sensing

### GROUND STATIONS

Equipped with software and hardware instruments, and with a wide dataset of satellite images including low as well as very high spatial resolution, both optical and radar, the laboratory relies on two satellite image acquisition systems: one located in Rome, and another one in the Broglio Space Center in Malindi, Kenya.

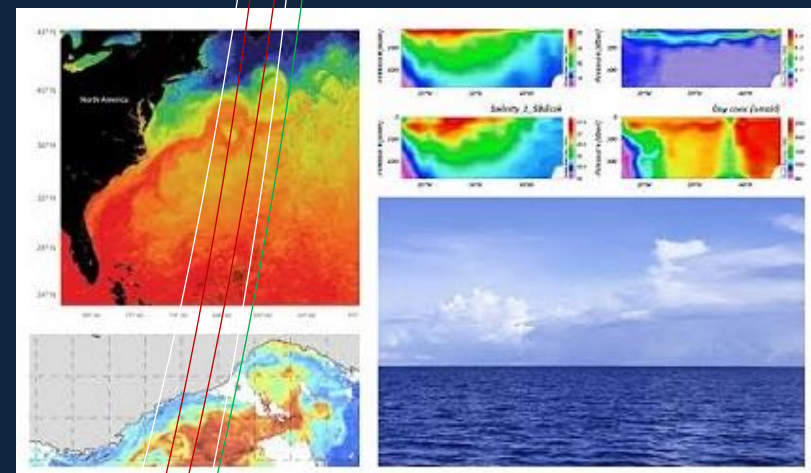
Rome Station acquires images from SEVIRI (Spinning Enhanced Visible and Infrared Imager), on board Meteosat Second Generation (MSG) satellite, and images from MODIS and AVHRR satellites, while Malindi Station could acquire high resolution images (Landsat, CBERS, etc.)

### OIL SPILL DETECTION

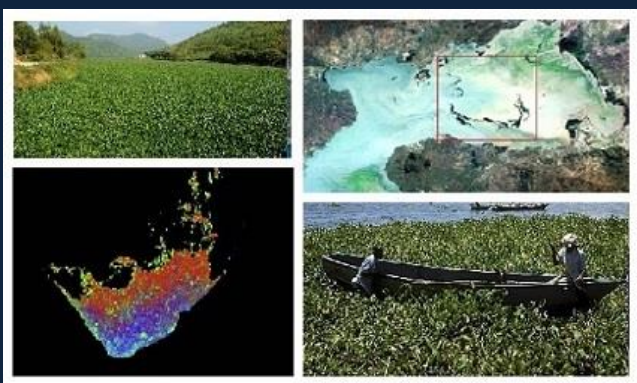
EO systems allow to detect and follow fast changing phenomena (like natural and anthropic disasters) providing the needed information for planning the necessary measures and reduce the impact of these events

### FIRE FOREST MONITORING

Forest fire maps are automatically-generated in real time by the algorithm every 15 minutes and updated according to the MSG-SEVIRI images acquisition time.



### REMOTE SENSING FOR THE ENVIRONMENT.



### AGRICULTURAL MONITORING

Agricultural land cover maps are critical for monitoring the current conditions and long-term changes of crop and pasture lands. SBAM project deals with a Italian-Kenyan initiative aiming at exploiting the combined use of optical and radar satellite data to retrieve biophysical characteristics of crops.

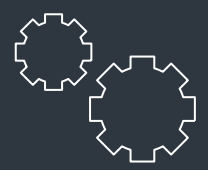
### VULCAN ERUPTIONS MONITORING

The European Volcano Observatory Space Services, (EVOSS) is an European Union science initiative, funded by the Seventh Framework Program (FP7) and using the latest European earth observation data.

### FLOOD MONITORING

Using multi-temporal satellite data for monitoring large rivers from space. A variety of passive and active sensors operating in the visible and microwave range are currently operating which can estimate inundation area and delineate flood boundaries.

*“Exploring the geographical imagination”*



### HARDWARE EQUIPMENT

- ◊ Acquisition system of the SEVIRI sensor on board the satellites of the series MSG(Meteosat Second Generation). The system also acquires reampled images within 1km of the MODIS sensors, AVHRR and GOES geostationary satellite (USA) and HIMAWARI (Japan);
- ◊ FLIR thermocamera;
- ◊ C LAI 2000 Plant Canopy Analyzer (LI-COR 2012) and Dualex 4-A Force for estimating LAI (Leaf Area Index) and leaves content of chlorophyll and polyphenols;
- ◊ Drone esarotors (SAPR SF6) equipped with a multispectral camera MicaSense with 5 channels, vertical take-off and landing , designed to perform aerial reconnaissance at a fixed point .



### WEB SOLUTIONS

- ◊ Satellite images processing;
- ◊ Automatic monitoring application;
- ◊ Near-real time monitoring;
- ◊ Optical and radar from low to very high resolution extensive archive;
- ◊ Web Map Service (WMS) for requesting geo-registered map images from one or more distributed geospatial databases;

### EOSIAL

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