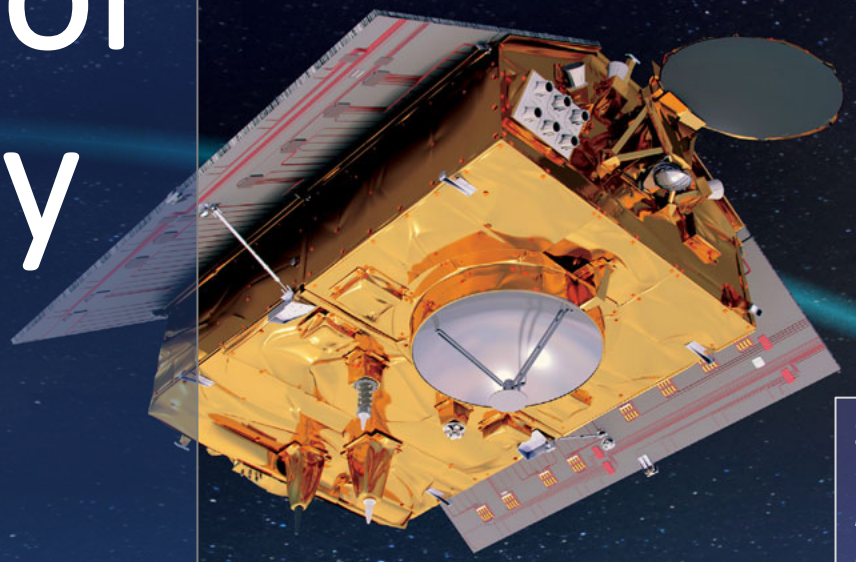
Virtual School of Oceanography from Space

23-27 November 2020



Sentinel 6,
the satellite devoted to sea-surface height mapping and sea-level rise monitoring with millimeter accuracy never reached before, was just launched on 21/11/2020
Click here to learn more on S-6

UN environment | MAP | SPA/RAC

In the frame of EU-funded Research and Innovation project ODYSSEA – Grant agreement No 727277

ODYSSEA

Introduction to the School of Oceanography from Space

Dr Slim GANA, Ph.D, HDR, Physical Oceanography

Observing and collecting information on the ocean is mandatory to understand how life evolves on Earth, to forecast its future evolution, to manage and to protect natural resources and populations. Satellites are powerful tools for observing the Earth and especially the Big Blue Ocean, since it is not easy to perform in-situ measurements at sea, while emphasizing that field observation remains necessary.

Observation of sea surface temperature through Thermal Infrared on-board sensors provides knowledge on how changes influence the behavior of fishes, can cause the bleaching of corals or algal blooms, affect weather along the coast and the Earth Global Climate. Indeed, the ocean plays a major role in regulating the planet's weather and climate. Satellite images of sea surface temperature also show paths of currents, eddies evolution and upwelling areas characterized by cold and nutrients enriched waters that rise up from the depths, often near the coasts.

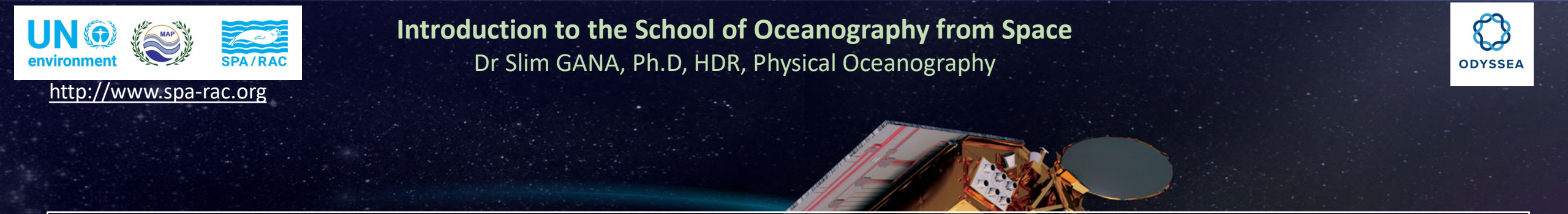
Sensors operating in the visible spectrum provide information about the color of the ocean. Color data help to determine the impact of floods along the coast, detect river plumes, and locate blooms of harmful algae that can contaminate shellfish and kill other fish and marine mammals. Ocean color data from satellites allows us not only to identify where an algal bloom is forming, but also to predict where it might drift in the future. In an other area of the spectrum, Synthetic Aperture Radar, which is very sensitive to the viscosity of the water surface, is appropriate to detecting oil spills and tracking illegal degassing at sea.

ODYSSEA is an EU-funded Research and Innovation project – H2020 Grant agreement No 727277

Introduction to the School of Oceanography from Space

Dr Slim GANA, Ph.D, HDR, Physical Oceanography

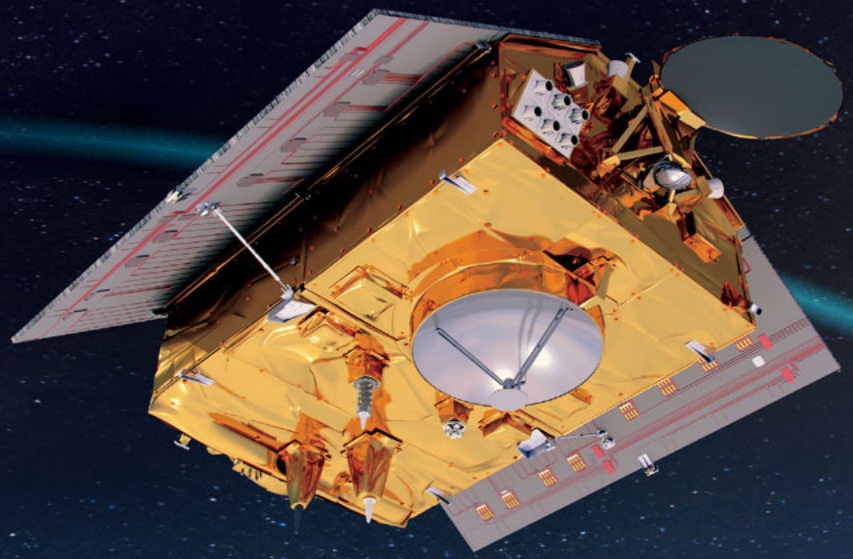
http://www.spa-rac.org



Everybody knows that the most significant impacts of climate change is sea level rise and storms intensification, which can cause inundations of coastal areas and islands, shoreline erosion, and destruction of important ecosystems such as wetlands and mangroves. Satellite altimeter radar measurements can be combined with numerical models and in-situ data to measure sea level and sea surface waves, both on a global and regional basis with unprecedented accuracy. The measurement of long-term changes in global mean sea level provides a way to test climate models' predictions of global warming.

However, powerful data systems and platforms are essential to store, easily access and analyze the huge volume of data offered and then transform it in actionable insight for a sustainable Blue Growth. This is one of the aims of the ODYSSEA project with its Marinomica service. As partner leading the capacity building work package of ODYSSEA, SPA/RAC, the UNEP/MAP center of specially protected area and marine biodiversity conservation, took the initiative to organize this Virtual School of "Oceanography from Space", with the support and kind collaboration of partners, scientists and professionals from specialized European organizations, among then EUMETSAT, LEGOS, DUTH, FORTH, CLS, DELTARES, ORBITAL-EOS, BLUE-LOBSTER IT.

ODYSSEA is an EU-funded Research and Innovation project – H2020 Grant agreement No 727277



Presentation of the Lecturers

UN environment

MAP

SPA/RAC

In the frame of EU-funded Research and Innovation project ODYSSEA – Grant agreement No 727277

ODYSSEA

Prof. SYLAIOS GEORGIOS

DEMOCRITUS UNIVERSITY OF THRACE, GREECE

Academic Background

BSc in Geology (Univ of Patras)

MSc in Oceanography

(Southampton Univ)

PhD in Oceanography

(Southampton Univ)

Professional Background and skills

Professor in Department of Environmental Engineering, DUTH

Coordinator of 34 Research projects (national and EU-funded)
80 Journal publications
8 Book Chapters - 1 e-Book

Coordinator of ODYSSEA Project

Dr Hayley Evers-King, EUMETSAT, UE

European Organisation for the Exploitation of Meteorological Satellites

https://www.eumetsat.int

Academic Background

10 years experience in the use of satellite data for research in marine science.

PhD in remote sensing of Harmful Algal Blooms, University of Cape Town

MSc in Oceanography, University of Southampton

BSc (Hons) Environmental Science, University of Plymouth

Professional Background and skills

Currently working at the interface between data users and providers at EUMETSAT including technical user support, training, service and application development.

Experience with ocean colour, SST and altimetry, as well as ocean models.

Python programmer

Passionate science communicator

Simon KEEBLE - BLUE LOBSTER IT LIMITED

Wales, United Kingdom

bluelobster
Software • Graphics • Communication
www.bluelobster.co.uk

Academic Background

COMMERCIAL

Professional Background and skills

Creative & Technical Director at software and communications consultancy Blue Lobster IT Limited

30+ years working in high performance data centric software development environments across a variety of sectors.

The last 15 years mainly focused in marine & aquatic sciences.

Prof. Florence Birol, CTOH/LEGOS, France

Laboratoire d'Etudes en Géophysique et Océanographie Spatiales

www.legos.obs-mip.fr/

Academic Background

- Habilitation à Diriger les recherches (*Research Supervising Qualification*)
- PhD in Physical Oceanography
- Master's degree

Professional Background and skills

- 2005-2017: Ass. Professor, Université Paul Sabatier, Toulouse, France
- 2012+: Head of the French observation service CTOH
- 2017+: Professor, Université Paul Sabatier, Toulouse, France

Research interests:

Development of altimetric data processing and applications dedicated to coastal areas. Physical oceanography. Environmental satellite data analysis.

Dr. Fernando Niño, CTOH/LEGOS, France

Laboratoire d'Etudes en Géophysique et Océanographie Spatiales

Academic Background

- Ph. D. in Geophysics (1997), Université Montpellier II, Montpellier (France)

- Software Engineer (1990),

- Computer Science Major at Universidad de los Andes, Bogota (Colombia)

Professional Background

2008->: Chief Technical Officer of the french altimetry service CTOH
2000-2008 : Project Leader in Scientific Application Development (IRD/Médias-France, Toulouse)

Skills & Research Interests:
Physics of the altimetry signal
Numerical modelling of geophysical processes
Parallel and concurrent programming

Fabien Léger, CTOH/LEGOS

Laboratoire d'Etudes en Géophysique et Océanographie Spatiales

Academic Background

Engineer in Water Science

Polytech'Montpellier (France)

Professional Background

2016 : CNRS Engineer at LEGOS, development of the CTOH coastal altimetry data processing chains.
Past : CNRS Engineer at CNRM, LEGOS and Ifremer

Skills & Research Interests

Coastal altimetry
Physical oceanography
Remote sensing

Dr Cori PEGLIASCO, CLS, France

Collecte Localisation Satellite

CLS
COLLECTE LOCALISATION SATELLITES
https://www.cls.fr

Academic Background

PhD in Physical Oceanography (2015)

« Vertical structure of mesoscale eddies in the 4 major Eastern Boundary Upwelling Systems, LEGOS (Toulouse, France)

Professional Background and skills

Detecting and tracking mesoscale eddies
Colocation with in situ data to analyse the eddies' 3D structure

2016 – 2020 : Post-doc on the vertical structure of mesoscale eddies in the Mediterranean Sea – ANR DYNED-Atlas and SHOM fundings, LEGOS (Toulouse, France)

Dr Katerina Spanoudaki, FORTH, Greece

Foundation for Research and Technology-Hellas

FOUNDATION FOR RESEARCH AND TECHNOLOGY - HELLAS

https://www.forth.gr/

Academic Background

- Diploma in Engineering (National Technical University of Athens)

- MSc in Environmental Engineering and Hydrology, (Imperial College)

- PhD in Water Resources Engineering (National Technical University of Athens & Cardiff University)

Professional Background and skills

- 2013- Collaborating Researcher, FORTH, Lecturer, Hellenic Mediterranean University

- Numerical modelling of coastal hydrodynamics and marine pollution, water resources engineering

Juan PEÑA, Chief Executive Officer, ORBITAL EOS

https://www.orbitaleos.com/

ORBITAL EOS
Earth Observation Solutions
Transforming space data into actionable insights

Academic Background

MSc Remote Sensing & Data Analytics

BSc Oceanography

Professional Background and skills

12 years as Tactical Coordination Officer (TACCO) onboard a Maritime Surveillance Aircraft for the Spanish Maritime Safety Agency (SASEMAR)

Spanish Institute of Oceanography (IEO), Researcher

Konstantinos ZACHOPOULOS, Research Associate

PhD Candidate in DUTH, Greece

Academic Background

PhD Candidate in Democritus University of Thrace, Greece

MSc in Marine Renewable Energy, Heriot Watt University, U.K.

BSc in Marine Sciences, University of the Aegean, Greece

Professional Background and skills

Solid experience in Remote Sensing techniques and GIS applications gained through participation in several EU funded projects (e.g ODYSSEA project, HERMES, TRITON)
Experience in hydrodynamic modeling in Rivers and Coastal Environment

Dr Nikolas KOKKOS , Research Associate, DUTH, Greece

Academic Background

- PhD in Oceanography

Democritus University of Thrace, Greece

- BSc in Environmental Engineering,
Democritus University of Thrace, Greece

Professional Background and skills

Experience in hydrodynamic modeling in Coastal and River Environment

Solid experience in Remote Sensing techniques and GIS applications gained through participation in several EU funded projects (e.g Figaro, Mare Nostrum, ODYSSEA, Hermes, Triton)

Lörinc MÉSZÁROS, Deltares, The Netherlands

https://www.deltares.nl

Academic Background

- PhD in Applied Statistics (ongoing)
- MSc in Hydroinformatics and Water management
- BSc in Civil Engineering

Professional Background and skills

- Data science applications for earth observation and numerical modelling
- Integrated monitoring and modelling of marine and coastal water quality
- Setting up downstream coastal prediction systems using Copernicus Services

AGENDA

GMT+1 time	10:00-11:00	11:00 - 11:15	11:15 - 12:15	12:15 - 14:30	14:30-15:30	15:30-16:30
Monday 23/11/2020	1- Welcome to the Virtual School by UNEP/MAP-SPA/RAC 2- Introduction to the Webinar and Odyssea (Georgios Sylaios (ODYSSEA Coordinator, DUTH University) 3 - Introduction to Oceanography from Space (Hayley Evers-King, EUMETSAT)	SHORT BREAK	Satellite Data Retrieval from Copernicus (Hayley Evers-King)	LUNCH BREAK	Overview of ODYSSEA project activities and outcomes Georgios Sylaios (ODYSSEA Coordinator)	
Tuesday 24/11/2020	1- Measuring Sea Surface Temperature from Space 2- Working with SST data from Satellites (Hayley Evers-King)	SHORT BREAK	1 - Measuring Ocean Color from Space 2 - Working with ocean color data from satellites (Hayley Evers-King)	LUNCH BREAK	Introduction to Marinomica Services and Products (Simon Keeble, BLIT)	
Wednesday 25/11/2020	- Measurement of Sea Surface Level using altimeter sensors in the open ocean - Retrieval of Tides, currents, waves and winds (Florence Birol, LEGOS)	SHORT BREAK	Satellite altimetry in the coastal zone (Florence Birol, LEGOS)	LUNCH BREAK	Meso-scale eddies and their dynamics using Marinomica (Cori Pegliasco, CLS)	
Thursday 26/11/2020	Exercises on satellite altimetry data - Session 1 (Florence Birol, LEGOS)	SHORT BREAK	Exercises on satellite altimetry data – Session2 (Fernando Nino and Fabien Léger)	LUNCH BREAK	Forecasting tools for wind and waves in Marinomica (Katerina Spanoudaki, FORTH)	Automatic detection of Offshore Oil Spill using Satellite data. (Juan Peña Ibanez, EOS-Orbital)
Friday 27/11/2020	Monitoring coastal erosion patterns from space: Coastal erosion 'hotspots' and trend analysis –(Konstantinos Zachopoulos, DUTH)	SHORT BREAK	Freshwater fluxes and SPM data products in river plumes - Nikolaos Kokkos (DUTH)	LUNCH BREAK	Eutrophication indices in Marinomica (Lorinc Meszaros, Deltares)	

Virtual School of Oceanography from Space

With the kind collaboration of:

23-27 November 2020

ODYSSEA is an EU-funded Research and Innovation project – H2020 Grant agreement No 727277