EARTHSYSTEMS 2022 summer course

Land-Atmosphere-Ocean interactions in a changing planet

A hands-on approach to Earth System observation and modelling

Tavira, Portugal

11-17 September

TARGET STUDENTS

PhD students in all topics of Earth System Science (Atmosphere, Ocean, Solid Earth, Geodesy, Environment), other post-graduate students.

LOCATION

Lodging at Tavira Youth Hostel, lectures at Tavira Library (thanks to the Tavira council) and Clube Tavira, field and laboratory work at IPMA Tavira Field Station (Ria Formosa, Algarve), including sea missions.

Fee: €200

Includes registration and diploma from FCUL (University of Lisbon), 6-night lodging with breakfast at the Tavira Youth Hostel, Daily lunch box, Daily transport from Tavira to the field Station. All other costs must be covered directly by the students. A few grants may be offered to applicants from Portugal (covering the fee) and from abroad (covering the fee, and if possible, the flight ticket).

APPLICATIONS

Deadline: 30 June 2022, with a short support statement from the PhD supervisor and a short motivation letter from the candidate, to be sent to summer_camp_2022@arditi.pt. Candidates will be notified of acceptance by 7th July 2022.

In case of overbooking, the organization will prioritize candidates in the 2 first years of their PhD program and will aim to maximize networking between students from different research groups. Any remaining positions will be offered on a "first come first go" basis after 1st July 2022.

Required: adequate clothing and shoes for field work. Laptop for class work.

Topics

The summer school will focus on hands-on sessions in the field (saltmarshes, beaches, dunes) and in the lab, at IPMA Tavira Field Station (https://eemt.ipma.pt/), including a nearshore sea mission. Observational and data processing methods will cover Geology, Meteorology, Physical Oceanography, Geodesy and Geophysics. The practical activities will be framed by classroom-based sessions. Students will present their work in a "pitch" 2-minute presentation.

OBSERVATION AND MODELLING OF ESTUARINE-COASTAL DYNAMICS

Nuno Vaz, Magda Sousa (U. Aveiro), Miguel Potes (U. Évora)

Lectures: A review of Physical Oceanography concepts; oceanography of the Algarve

Field: Profiling the water column with CTD, Current-meter and ADCP; Water surface spectral reflectance; Solar downwelling spectral irradiance; Profiling the water column spectral irradiance

Lab: Computation and visualization of estuarine fluxes; The use of remote sensing data in estuaries and coasts; Basic Implementation and realistic results using hydrodynamic models; Simulation of outflow plumes and coastal processes (Ekman Spiral, estuarine plumes, costal upwelling)

ATMOSPHERIC PROCESSES

Maria João Costa, Daniele Bortoli (U. Évora), Pedro Mateus (IDL) , Rui Caldeira (Arditi/IDL)

Lectures: Atmospheric structure in an environment dominated by the sea breeze

Field/Lab: Radio sounding at different times of the diurnal cycle; Target observations with a long range meteo drone; Round-the-clock GNSS observations of atmospheric water vapor; Ceilometer continuous measurements of atmospheric backscatter profiles; Sun-photometer continuous measurements of atmospheric aerosols and water vapor

COASTAL ENVIRONMENTS AND PROCESSES

Tanya Silveira, Marcos Rosa, Pedro Brito, Carlos Sousa, Teresa Drago (IPMA); Conceição Freitas, João Cascalho, Rui Taborda (FC-UL); Pedro Costa, Pedro Pina (DCT-UC)

Lectures: Coastal environments and processes; The Ria Formosa coastal system

Field/Lab: Sediment sampling of the barrier island environments (including cores and trenches) and lab analysis; Characterization of sedimentary structures with geo-radar; Topography and geomorphology with GNSS and drones; Retrieving nearshore bathymetry with multibeam echosounder; Characterization of sea bottom structures with seismic methods and side-scan sonar

SURFACE-ATMOSPHERE INTERACTIONS AND FOREST FIRES

Rui Salgado, Flávio Couto and Nuno Guiomar (U. Évora), Michaël Sicard (UPC Barcelona), Luis Barbero González (U. Cádiz) , Paulo Pinto (IPMA)

Lectures: Pyro-convection and pollutant transport; Atmospheric aerosol remote sensing for monitoring biomass burning transport; Application of drones in the research of forest fire prevention and fighting;

Field/Lab: Observations together with *Atmospheric Processes*; 3D visualization of a simulated pyro-convective system

Sponsors:

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