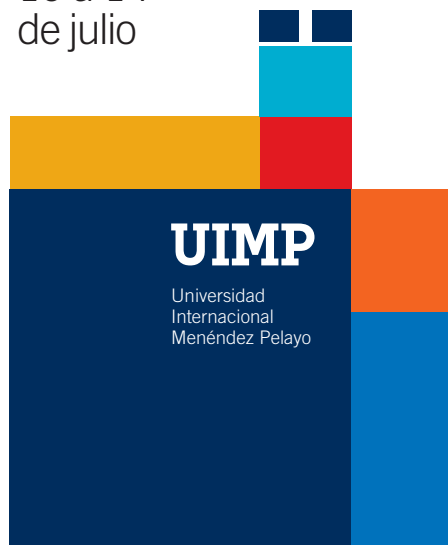


Cursos
de verano
Santander
23

10 a 14
de julio



ENCUENTROS

XIX INTERNATIONAL
SCHOOL OF
ASTROBIOLOGY
"JOSEP COMAS I
SOLÀ"

Searching for
Life on
Ocean Worlds

Horario y dirección de contacto

Mañana de L a V: 9.00 a 14.00 h

Santander

Campus de Las Llamas Avda. de
Los Castros, 42 39005 Santander
Tlf.: 942 29 87 00

Madrid

Calle Isaac Peral, 23 28040 Madrid
Tlf.: 91 592 06 31 / 33

A partir del 19 de junio

Mañana de L a V: 9.00 a 14.00 h
Tarde de L a J: 15.30 a 18.00 h

Santander

Palacio de la Magdalena 39005
Santander
Tlf.: 942 29 88 00

alumnos@uimp.es

www.uimp.es



Patrocinio:



Colaboración:



Este curso es susceptible de ser reconocido como formación permanente del profesorado para el personal docente de los centros que imparten las enseñanzas reguladas en la Ley Orgánica 2/2006, de Educación, en base al artículo 21 y 29 de la Orden EDU/2886/2011, de 20 de octubre, por la que se regula la convocatoria, reconocimiento, certificación y registro de las actividades de formación permanente del profesorado.

Código 65ei - ETCS: 2,5

Directors

Rosalyn M.C. Lopes

Jet Propulsion Laboratory (JPL), NASA, USA

Víctor Parro García

Centro de Astrobiología (CAB), CSIC-INTA, Spain

Organization

Carlos Briones Llorente

Centro de Astrobiología (CAB), CSIC-INTA, Spain

The 2023 Summer School will be focused on the exploration of ocean worlds orbiting the giant planets of our solar system. Moons such as Enceladus, Europa, Ganymede, and Titan are key astrobiological targets for future exploration by both NASA and ESA missions. These moons contain global liquid water oceans underneath icy surfaces and provide a different astrobiological perspective from rocky worlds such as Mars. Recent exploration has revealed the diverse biomes in Earth's deep oceans and ice sheets and has opened up our ideas of habitability. Ocean worlds present a deep potentially habitable environments, dominated by the physical processes of water and ice, where alien life could exist in our Solar System.

The Cassini mission revealed water vapor plumes spewing material from the interior of Enceladus, and Titan as an organic-rich world having a methane cycle similar to the hydrological cycle on Earth, with an interior ocean that is potentially habitable. Titan is the target of NASA's Dragonfly mission, which will explore the chemistry and habitability of its surface using a rotorcraft. The ocean underneath Jupiter's moon Europa was revealed by the Galileo mission and, since then, evidence for water vapor plumes spewing from its interior has been mounting. Europa is the target of NASA's Europa Clipper mission and will also be studied by ESA's JUICE mission. Ganymede, the solar system's largest moon, will be studied in detail by the JUICE mission, and is also an ocean world that may harbor conditions favorable to the emergence of life. These moons, as well as other potential ocean worlds such as Neptune's moon Triton or Uranus's moon Miranda, provide a rich subject area for the study of astrobiology and how life could have evolved in their hidden oceans.

Four outstanding teachers (two American and two European), experts in the field, will show us the latest news and discoveries, what energy sources keep these worlds liquid, how life could thrive under the ice crust ocean, and what are the main technological challenges to investigate the habitability and the search for evidences of a hypothetical form of life.

Matrícula: Solicitud
online





Monday 10

- 10:00 h Welcome lectures
Astrobiology at CAB
Víctor Parro
Astrobiology at NASA
Rosalý M.C. Lopes
- 10:45 h How to participate in missions at
NASA and ESA
Morgan L. Cable
Jet Propulsion Laboratory(JPL), NASA,
USA
Nicolas Altobelli
European Space Agency(ESA), Madrid,
Spain
Rosalý M.C. Lopes
Víctor Parro
- 11:30 h Ocean worlds of the Jovian system
Nicolas Altobelli
- 15:00 h Laboratory and analog field work
plays a key role in mission science
Olga Prieto Ballesteros
Centro de Astrobiología (CAB),CSIC-INTA,
Madrid, Spain



Tuesday 11

- 09:00 h Excursion to Altamira Museum
and El Soplao caves (whole day)



Wednesday 12



- 10:00 h Ocean worlds of the Saturn
system 1: Titan
Shannon M. MacKenzie
Johns Hopkins University Applied
Physics Laboratory, Maryland, USA
- 11:30 h Ocean worlds of the Saturn
system 2: Enceladus
Morgan L. Cable
- 15:00 h Clipper and JUICE missions to a
habitable ocean world
Nicolas Altobelli



Thursday 13

- 10:00 h Dragonfly mission to Titan: Flights
of exploration across a carbon-rich
ocean world
Shannon M. MacKenzie
- 11:30 h Enceladus mission concepts:
Sampling an alien ocean without
the need to dig or drill
Morgan L. Cable
- 15:00 h Planetary Protection
considerations for ocean worlds
Olga Prieto Ballesteros
- 17:00 h Open lecture (in Spanish).

La investigación astrobiológica de
los satélites helados de Júpiter y
Saturno
Olga Prieto Ballesteros

Friday 14



- 10:00 h Student presentations
- 11:30 h Synthesis + diplomas

