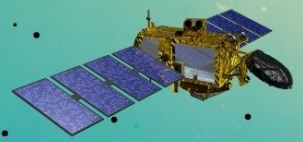
ARGONAUTICA, AN EDUCATIONAL PROJECT USING JASON DATA



1 TEAM
2 PRESENTATIONS

FRIDAY, 4TH NOV 2022 11 50AM

Continued,
enhanced ocean altimetry
and climate monitoring
from space

Monteil
développeur de talents

académie Toulouse
RÉGION ACADÉMIQUE OCCITANIE
MINISTÈRE DE L'ÉDUCATION NATIONALE, DE L'ENSEIGNEMENT SUPÉRIEUR ET DE LA RECHERCHE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Bergame
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Padoue
Bielle
Novare
Milan
Verceil
Pavie
Turin
Plaisance
Mantoue
Rovigo
Asti
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Perpignan
Andorre-la-Vieille
Gérone
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Terrassa
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ALEXIS MONTEIL HIGH-SCHOOL

FROM SATELLITES TO CHLOROPHYLL

Our project

How supplement the satellite's data on the ocean with our buoy ?

PART 1

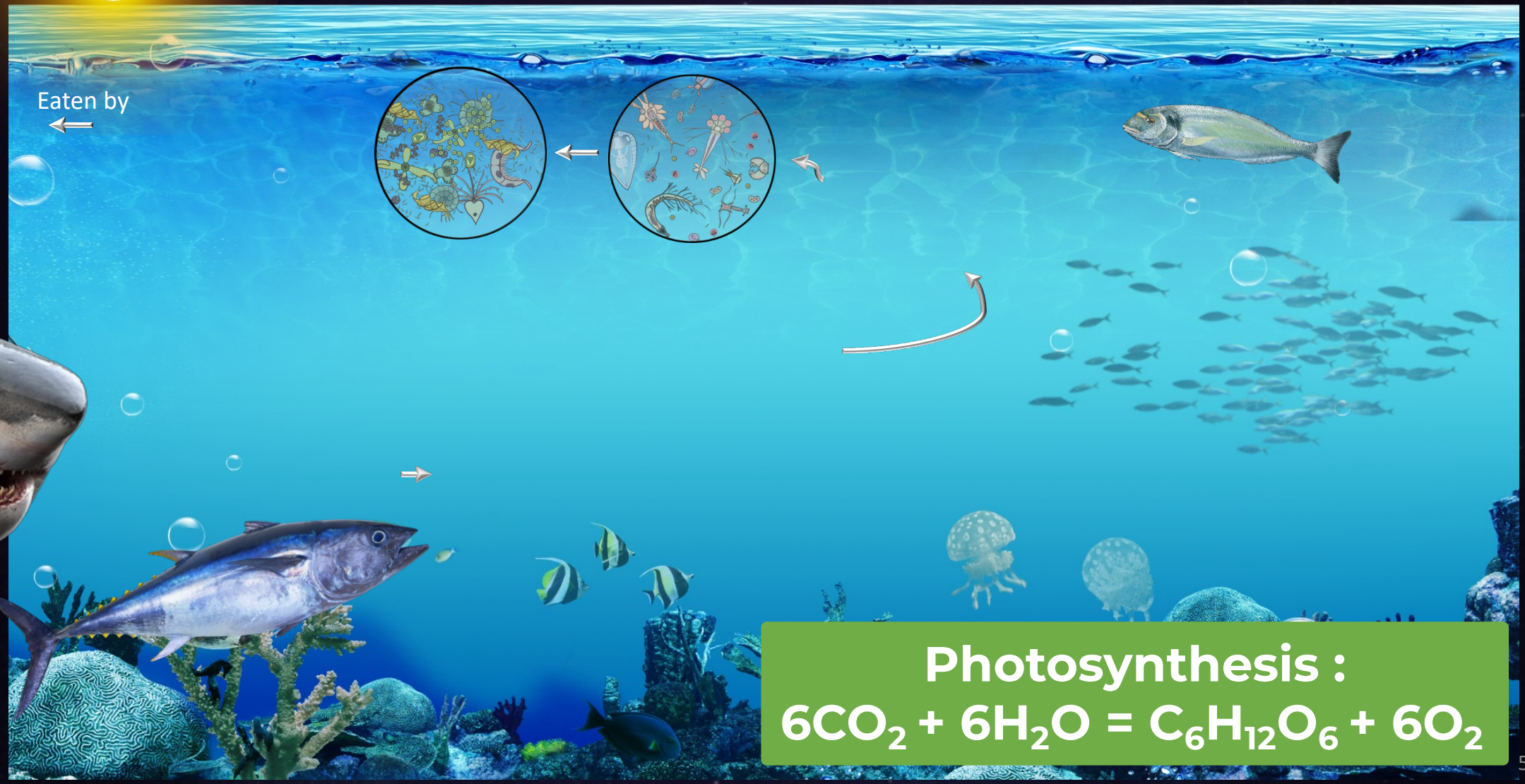
The satellites observe the bloom of phytoplankton

PART 2

Our last data by our buoys “Pegase” and “Meduse”

I. The satellites observe the bloom of phytoplankton

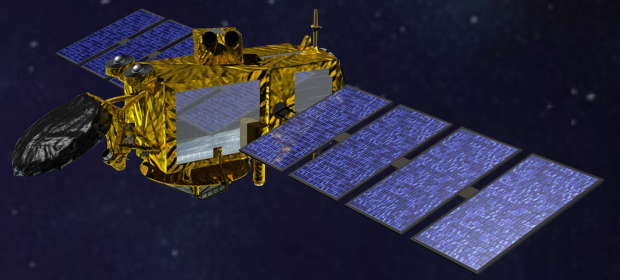
A) Importance of phytoplankton



Photosynthesis :

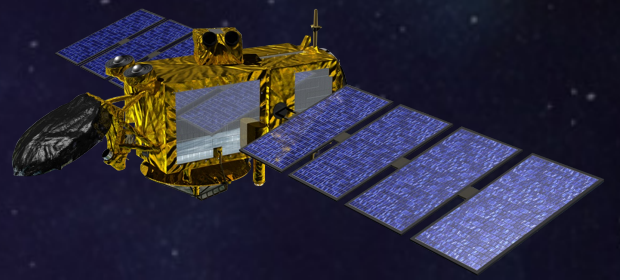
$$6CO_2 + 6H_2O = C_6H_{12}O_6 + 6O_2$$

B) FROM SATTELITES TO PHYTOPLANKTON

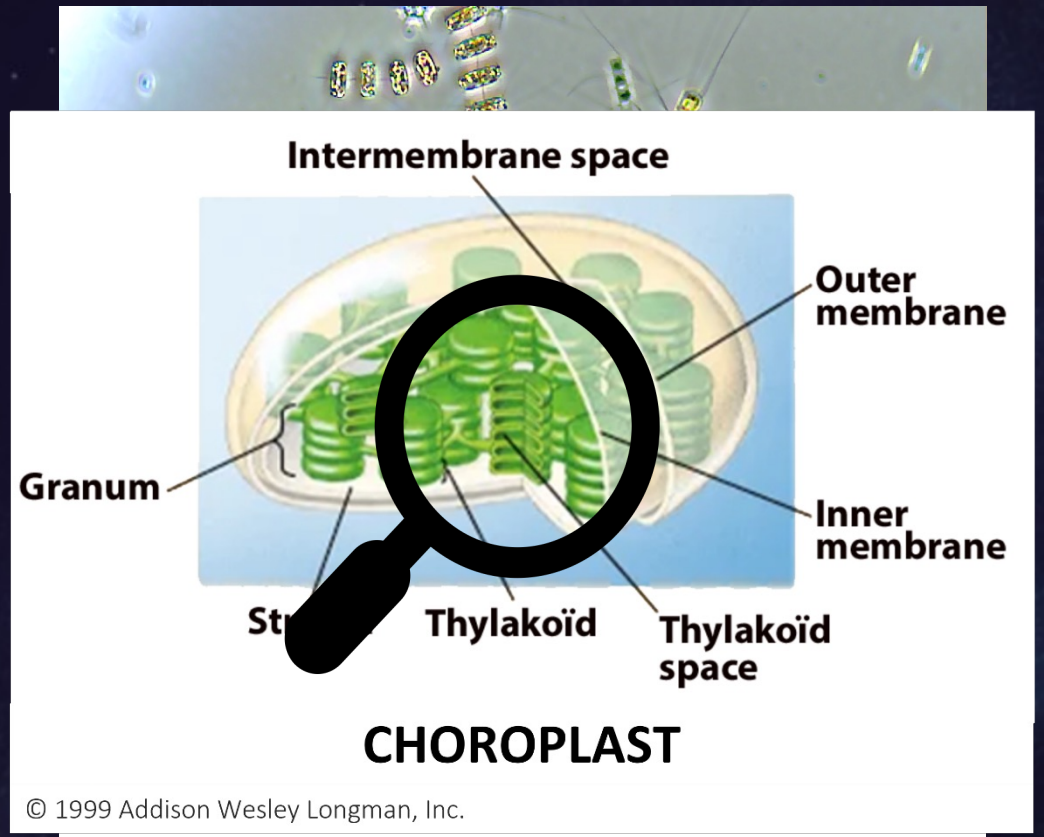


B) FROM SATTELITES TO PHYTOPLANKTON

University of Rhode Island/Stephanie Anderson. NASA Earth Expeditions



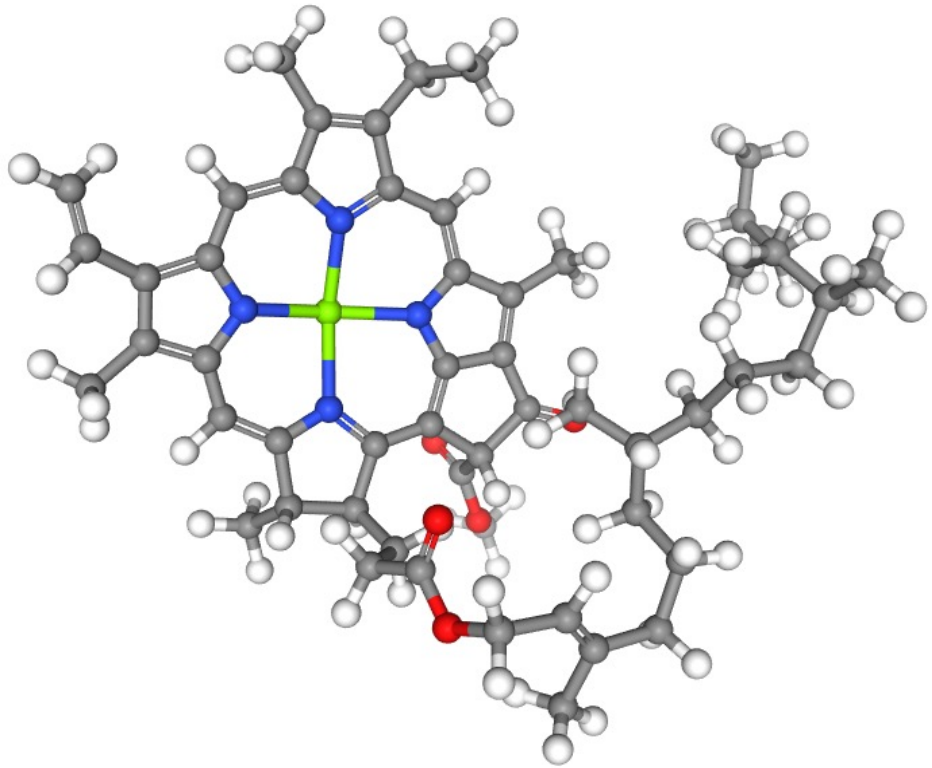
B) FROM SATTELITES TO PHYTOPLANKTON



University of Rhode Island/Stephanie Anderson. NASA Earth Expeditions

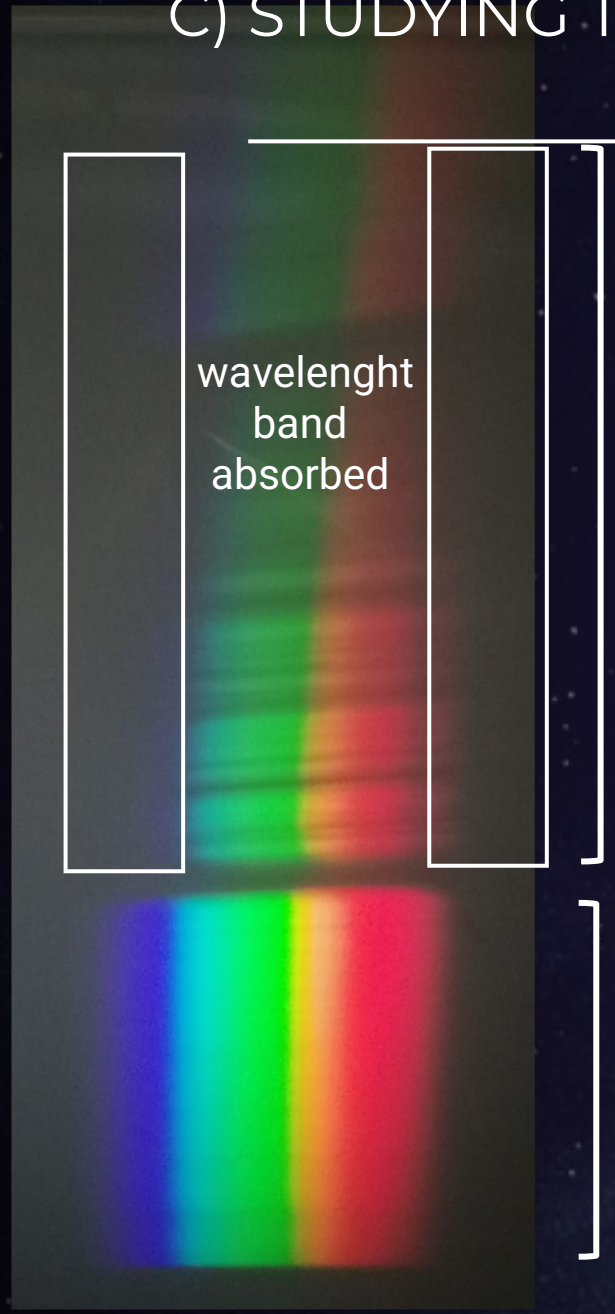
B) FROM SATTELITES TO PHYTOPLANKTON

Chlorophyll A

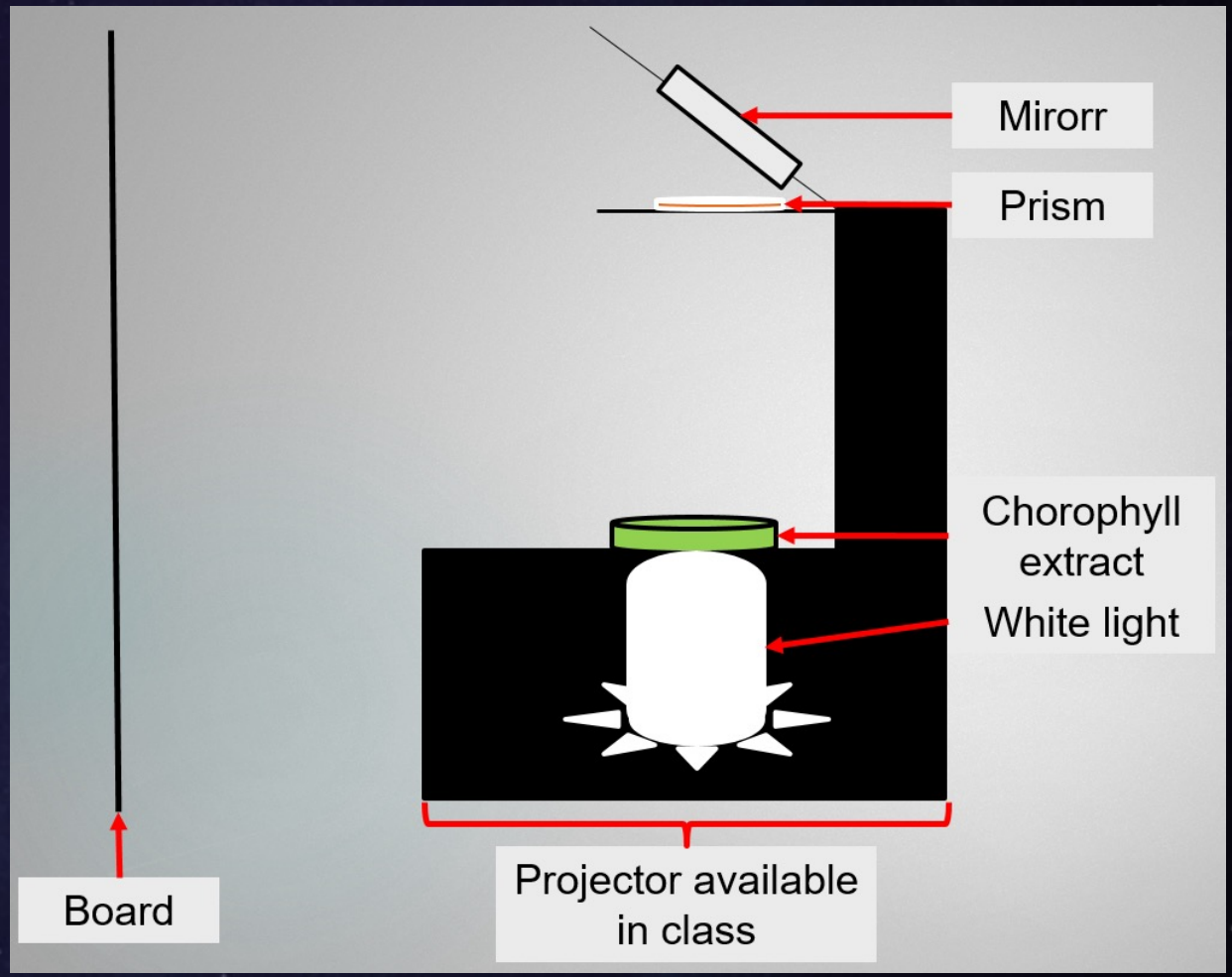


Atoms : **C** H **Mg** **N** **O**

C) STUDYING THE CHLOROPHYLL AND THE WHITE LIGHT BREAKDOWN



white light breakdown



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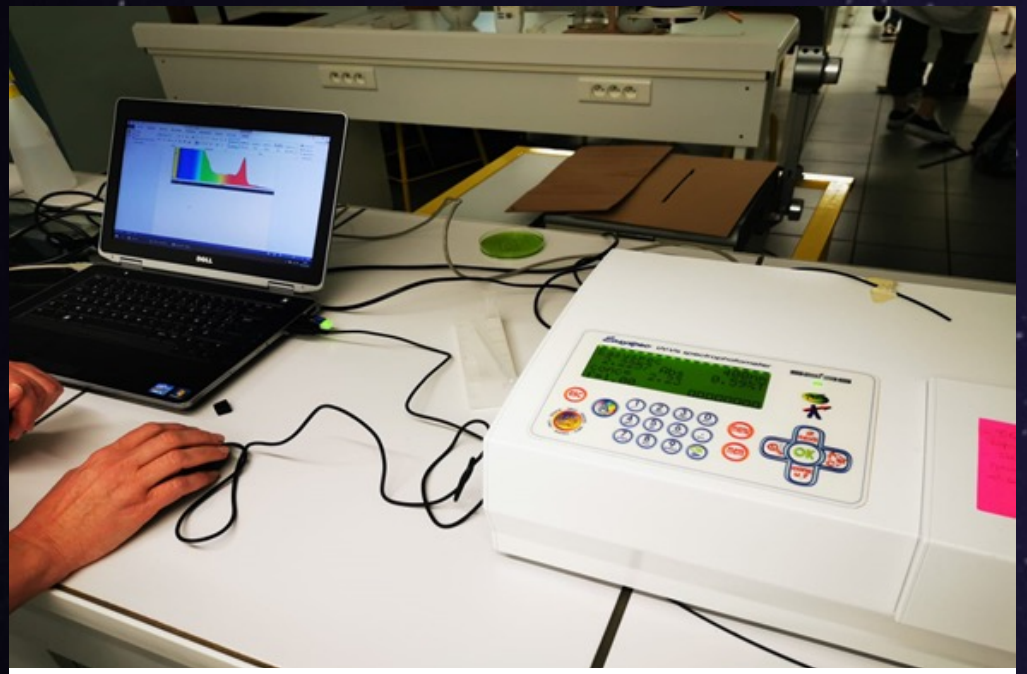
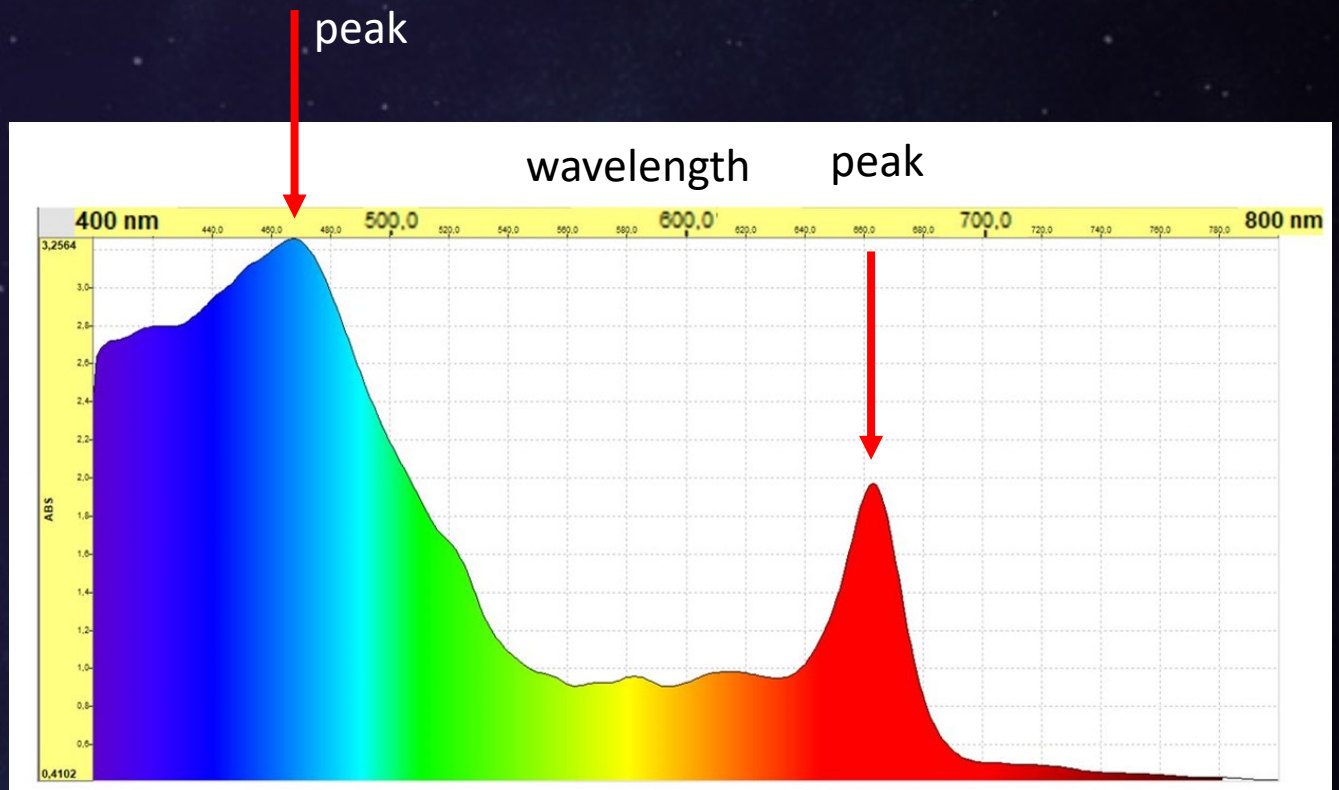


Our manipulations with a spectrophotometer

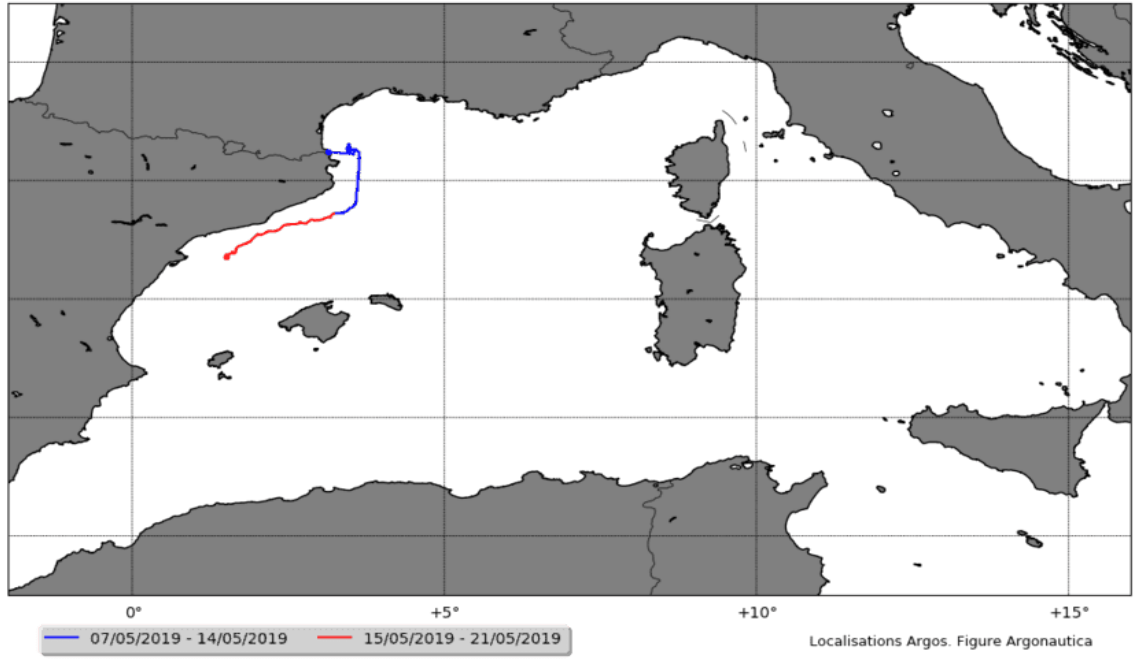


Chlorophyll's absorption spectrum

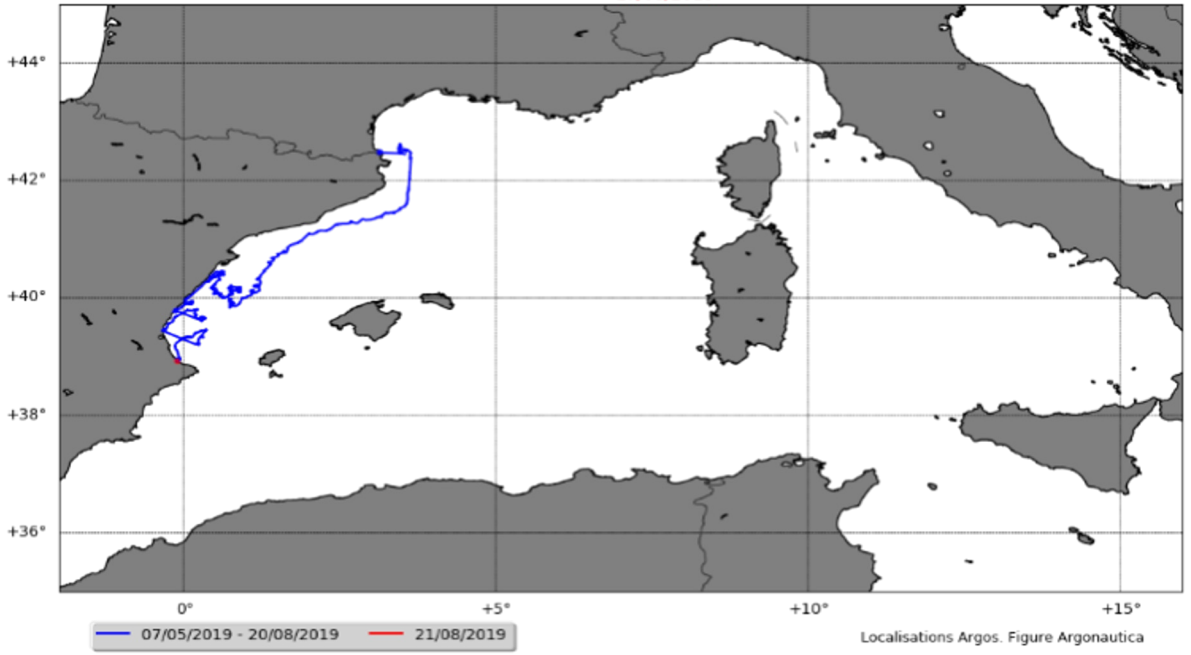
II. Our last data by our buoys “Pegase” and “Meduse”

A) The “Pegase” route

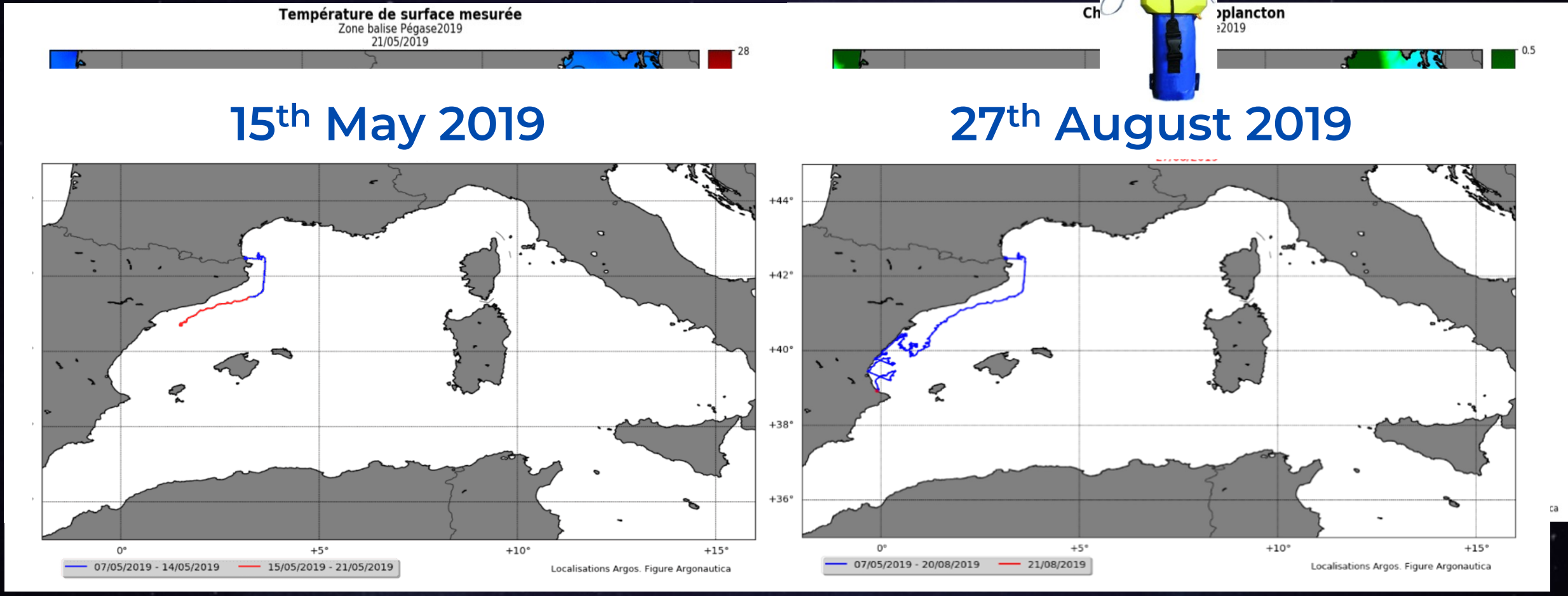
15th May 2019



27th August 2019



B) Satellite's data analyze during “Pegase” route



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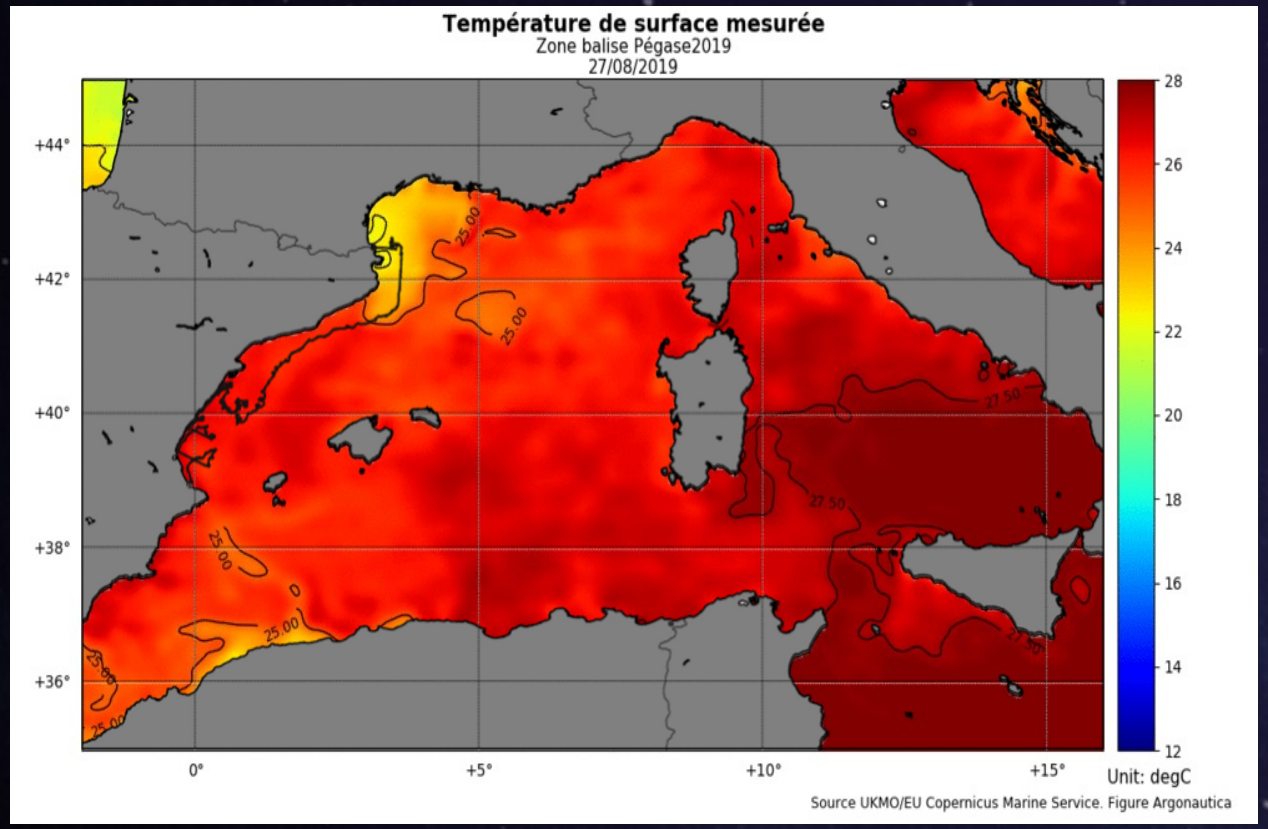
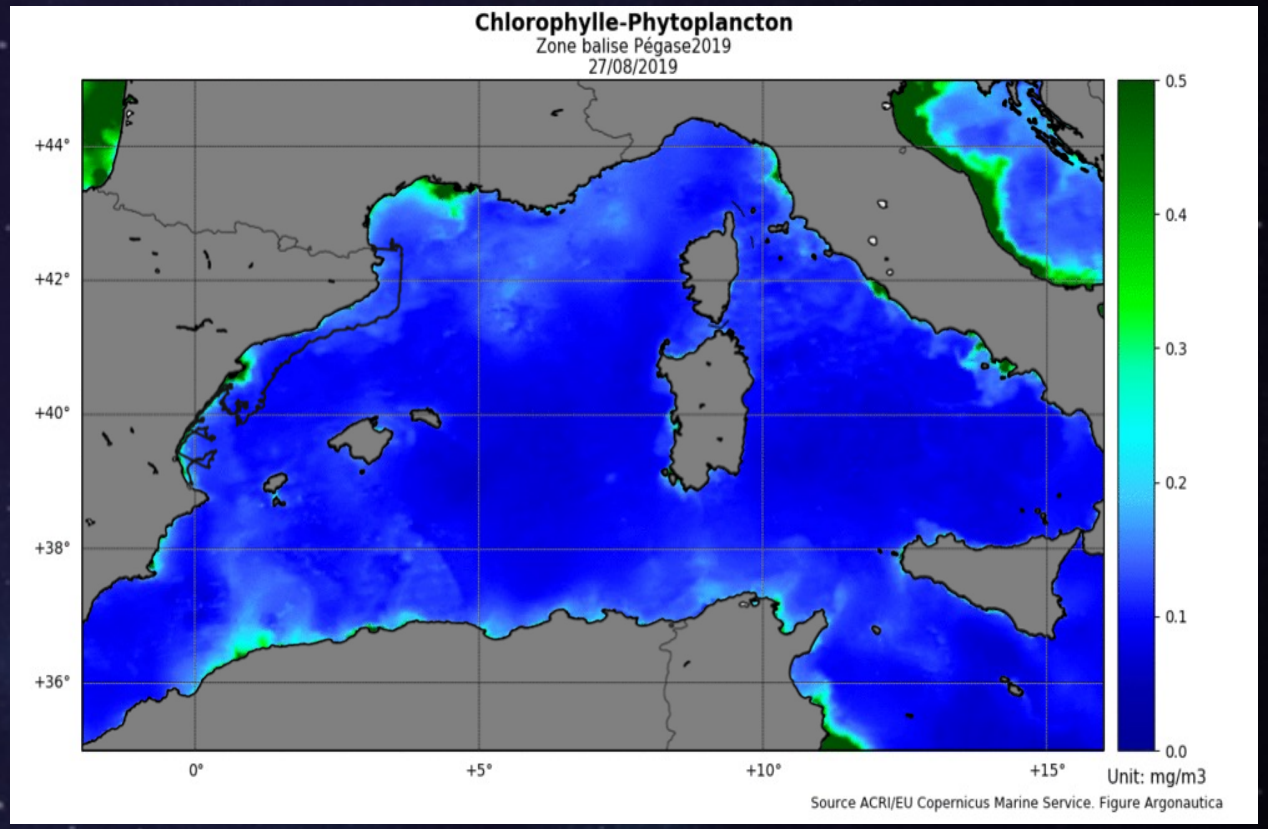
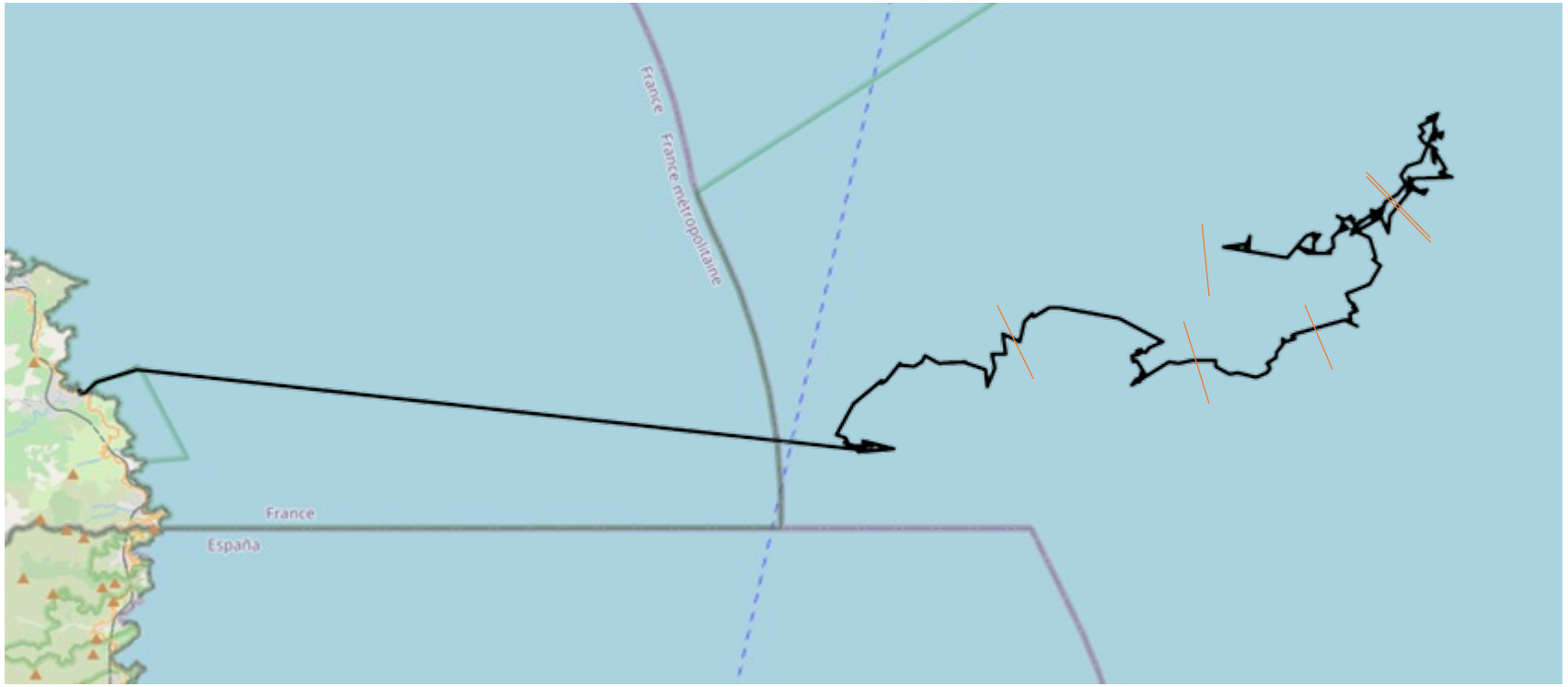




C) Satellite's data comparison with “Meduse”



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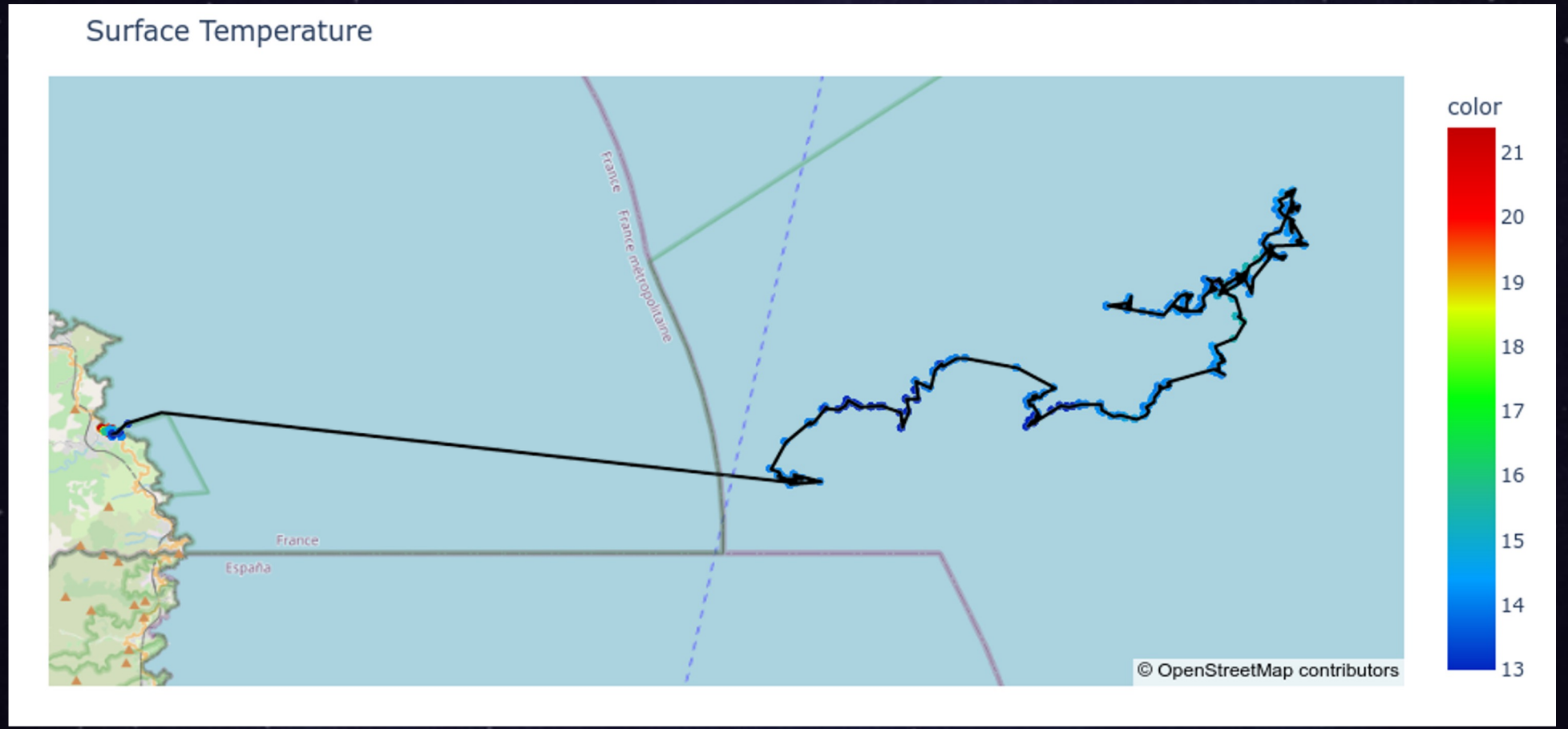
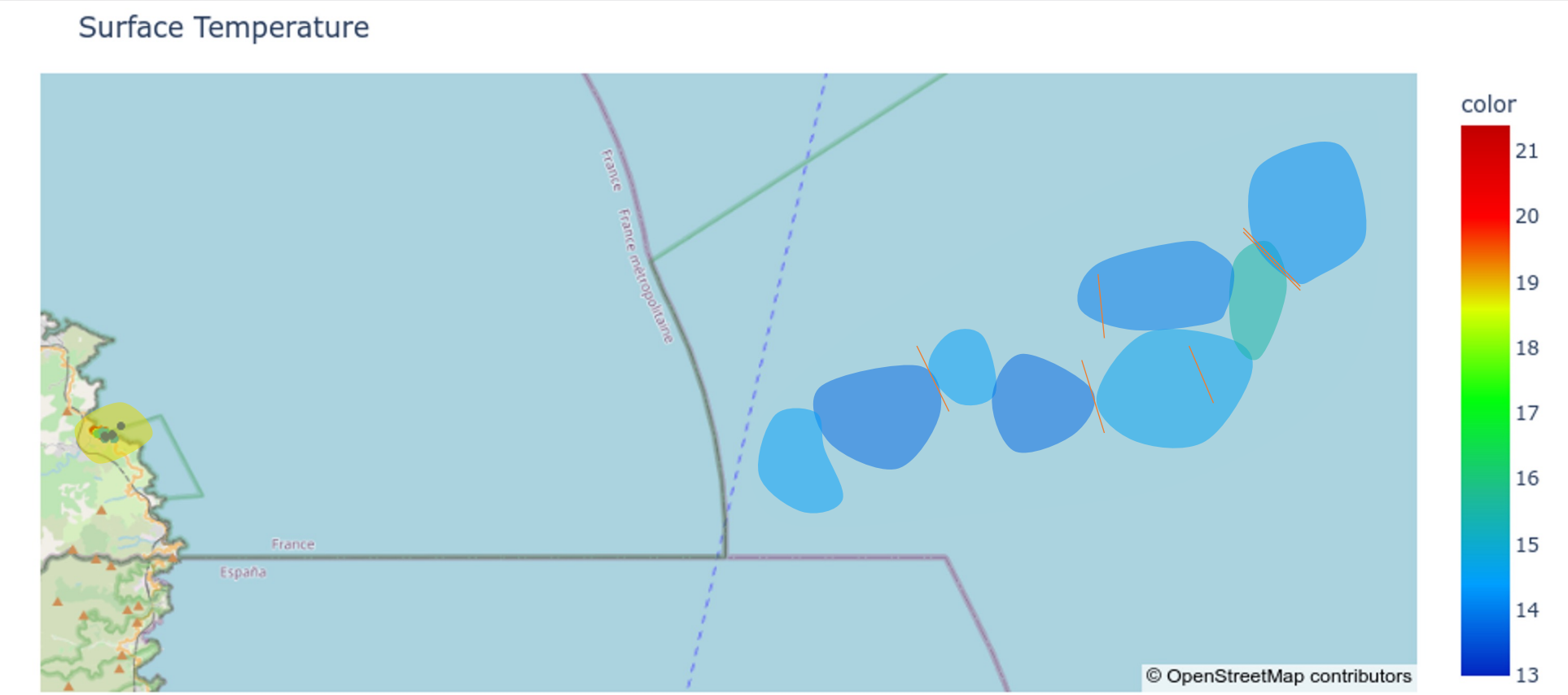
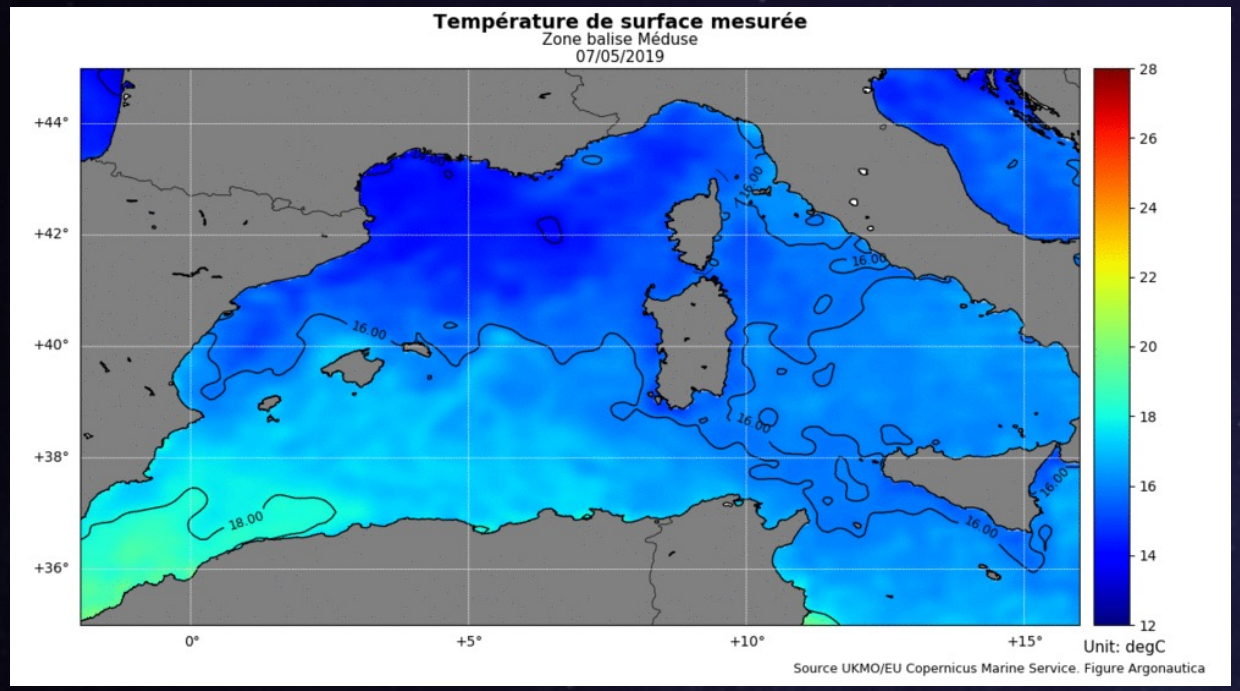


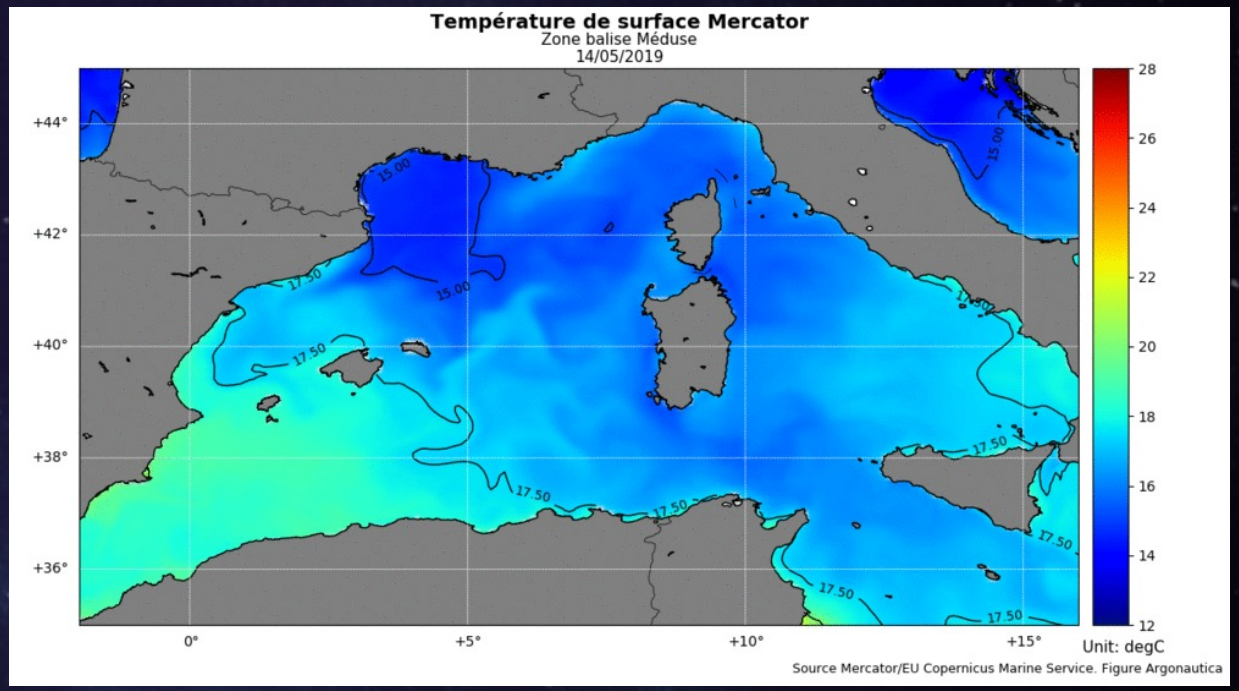
C) Satellite's data comparison with “Meduse”



24 hours

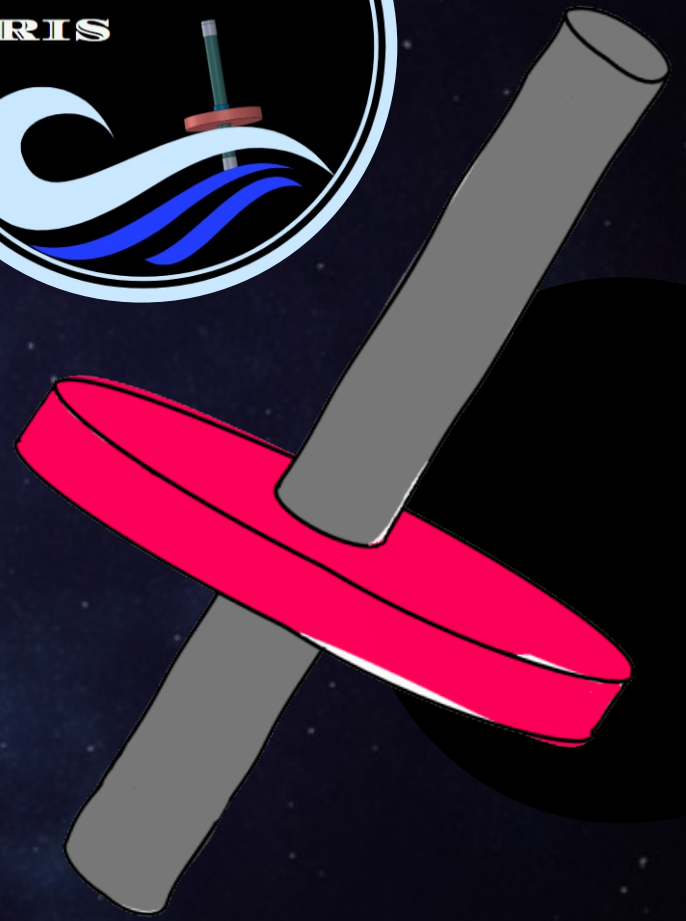
C) Satellite's data comparison with “Meduse”

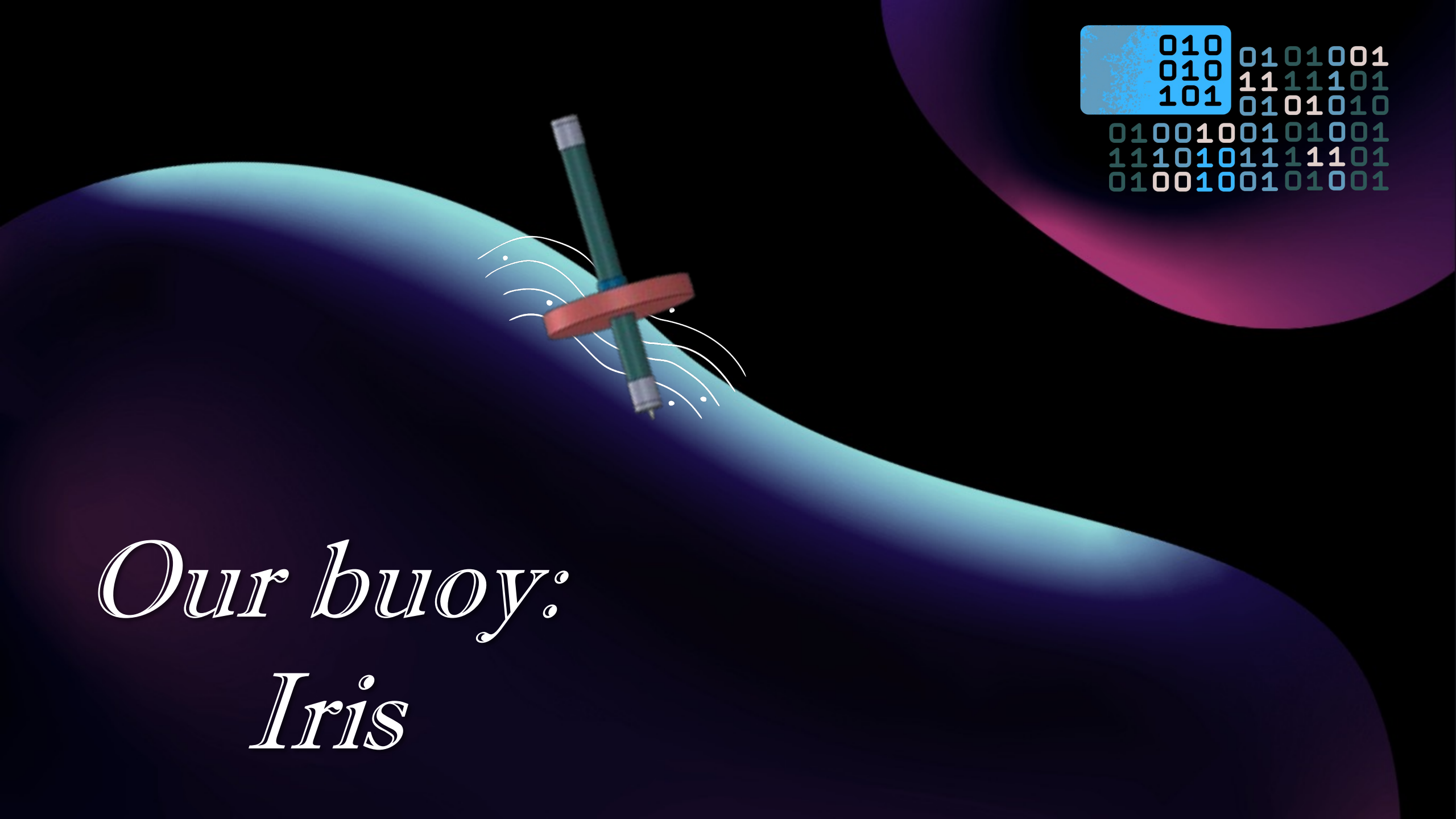




Conclusion I : Buoy and Satellites

- Low cost
- Better accuracy
- Additional information



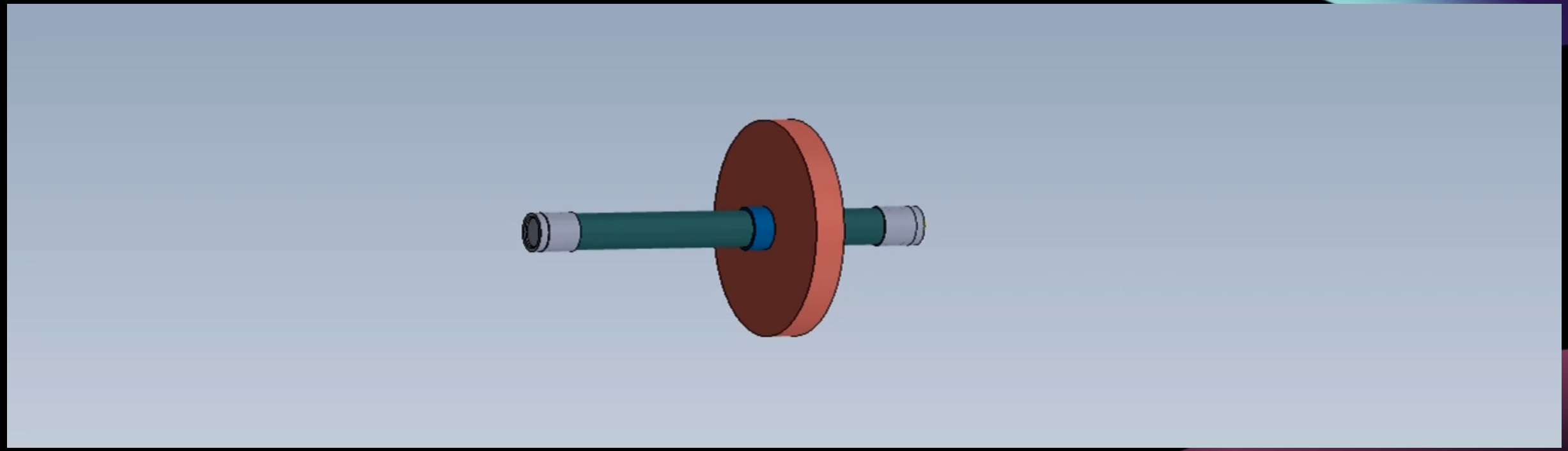


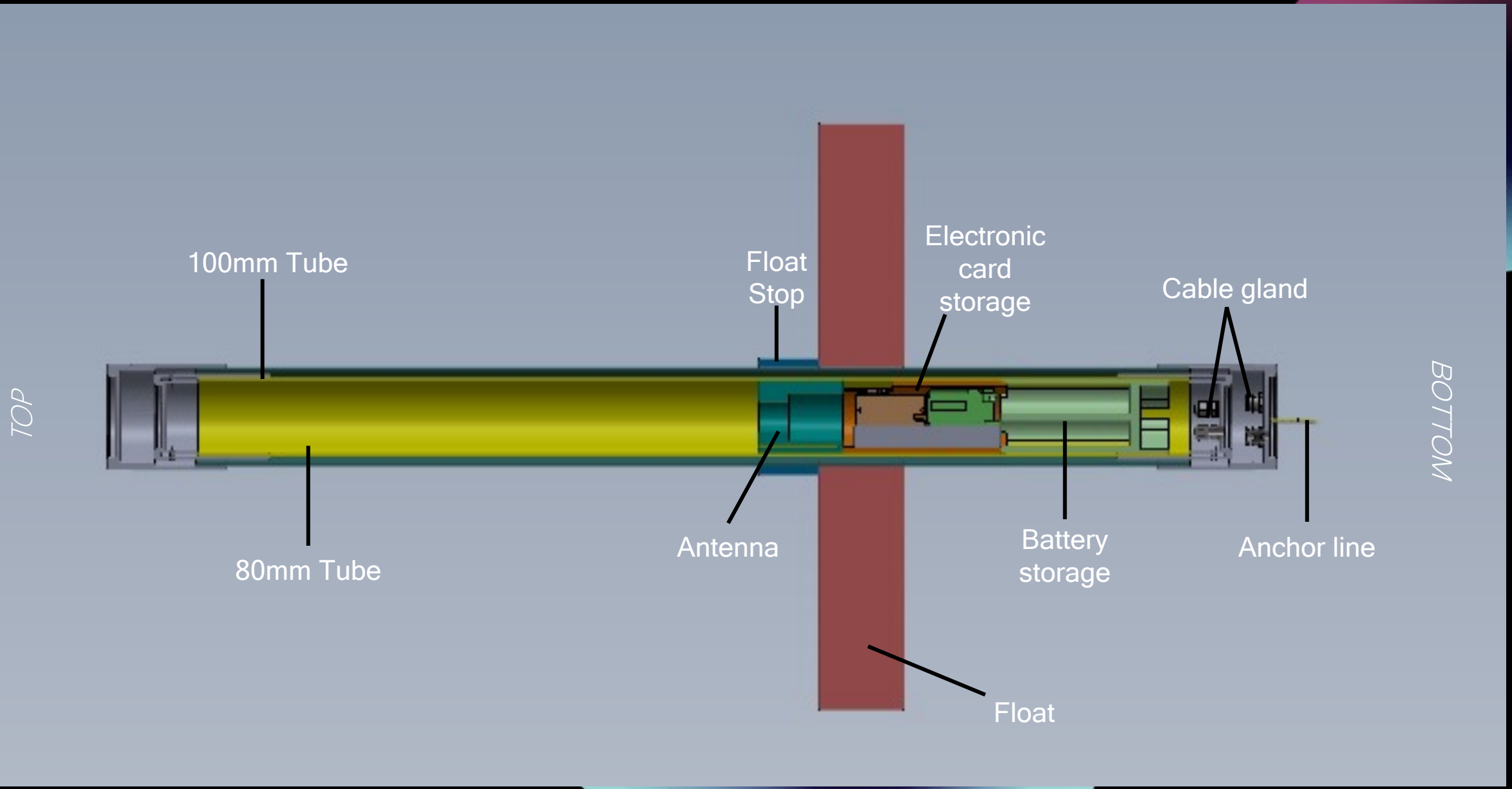
Our buoy: Iris

How supplement the satellite's data on the ocean with our buoy ?

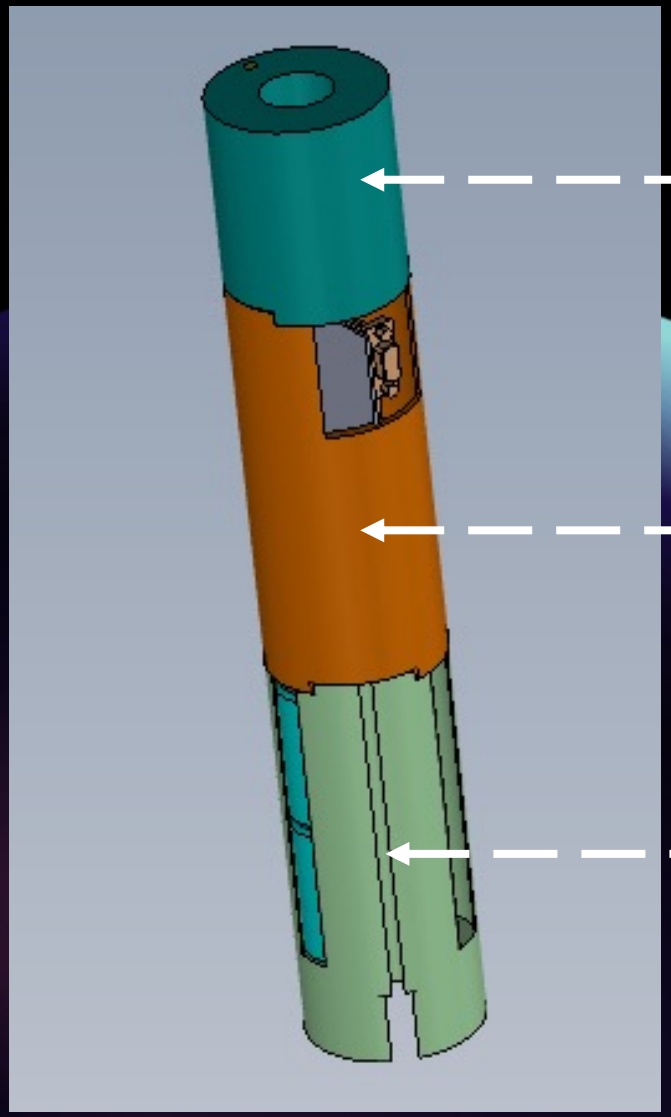
- Modelling and design
- Electronic and programming

MODELING AND CONCEPTION




100mm Tube
Float
Stop
Electronic
card
storage
Cable gland
TOP
BOTTOM
80mm Tube
Antenna
Battery
storage
Anchor line
Float

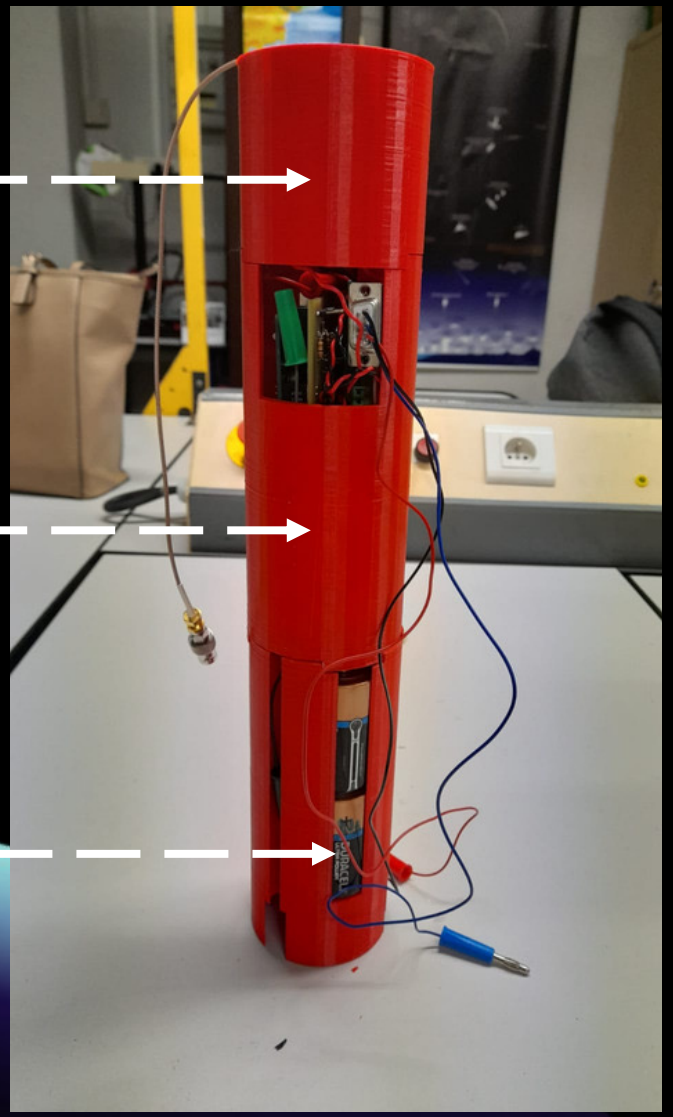
INTERNAL COMPONENTS

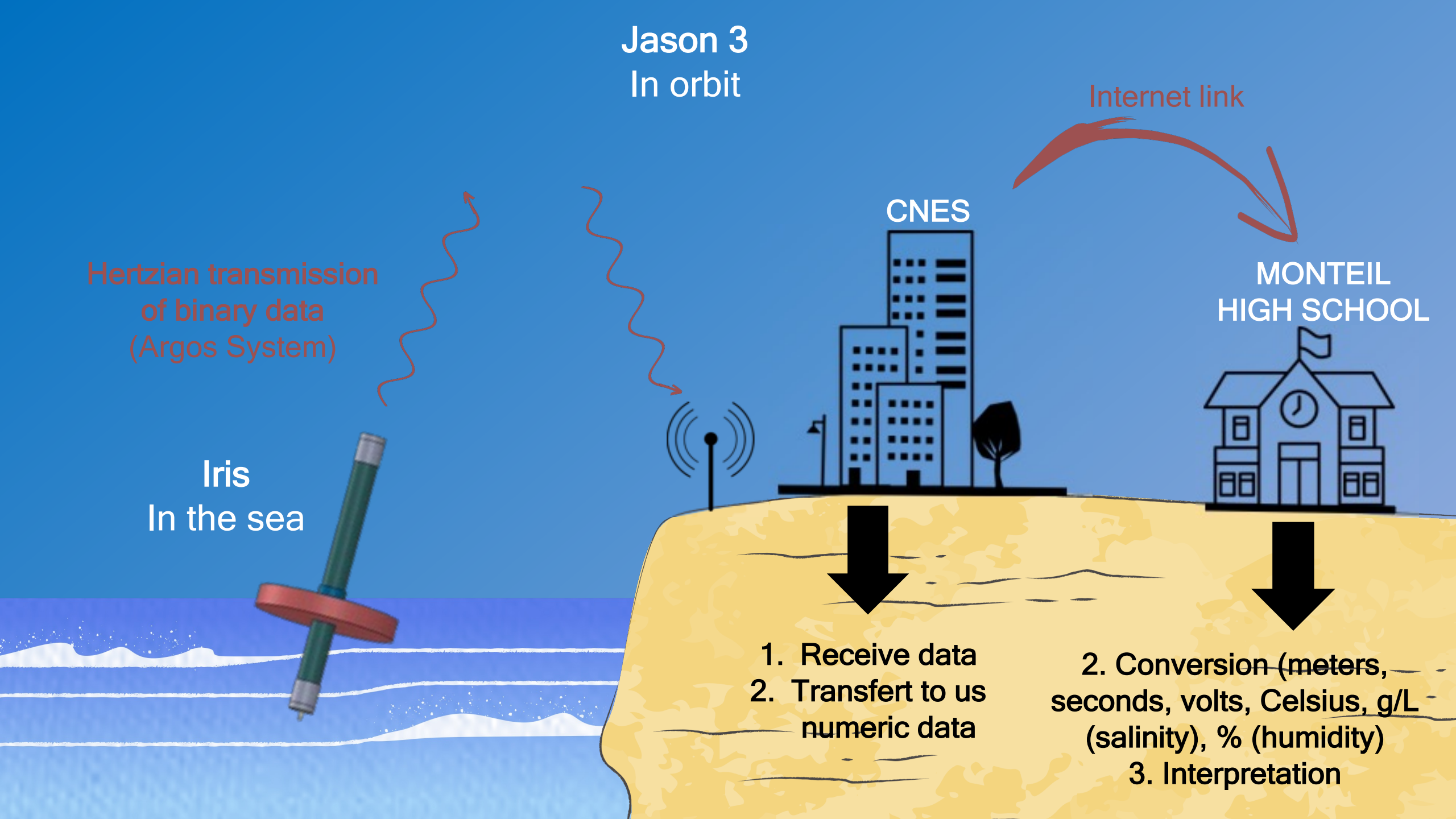


ANTENNA SUPPORT

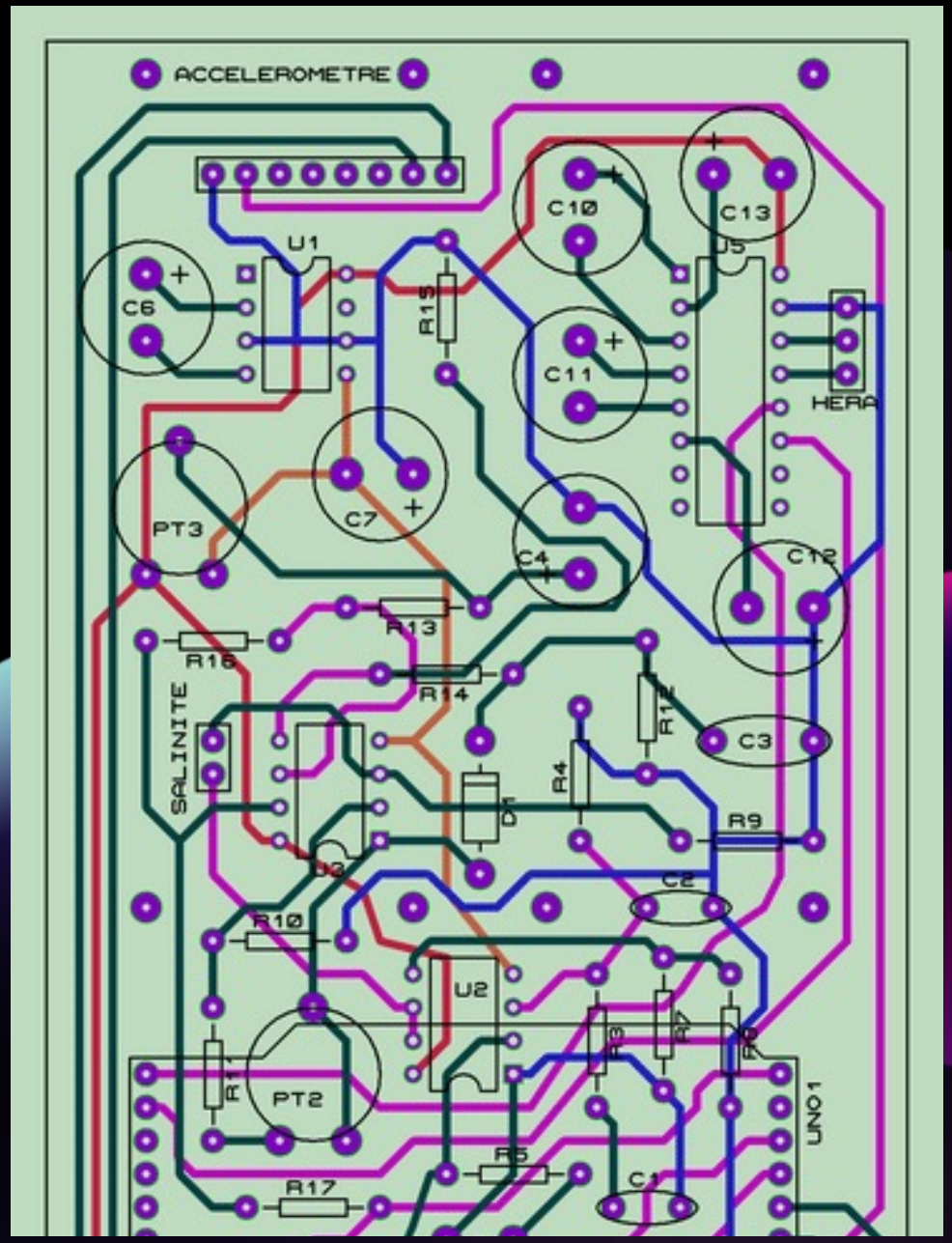
ELECTRONICAL
CARD STORAGE

BATTERY STORAGE

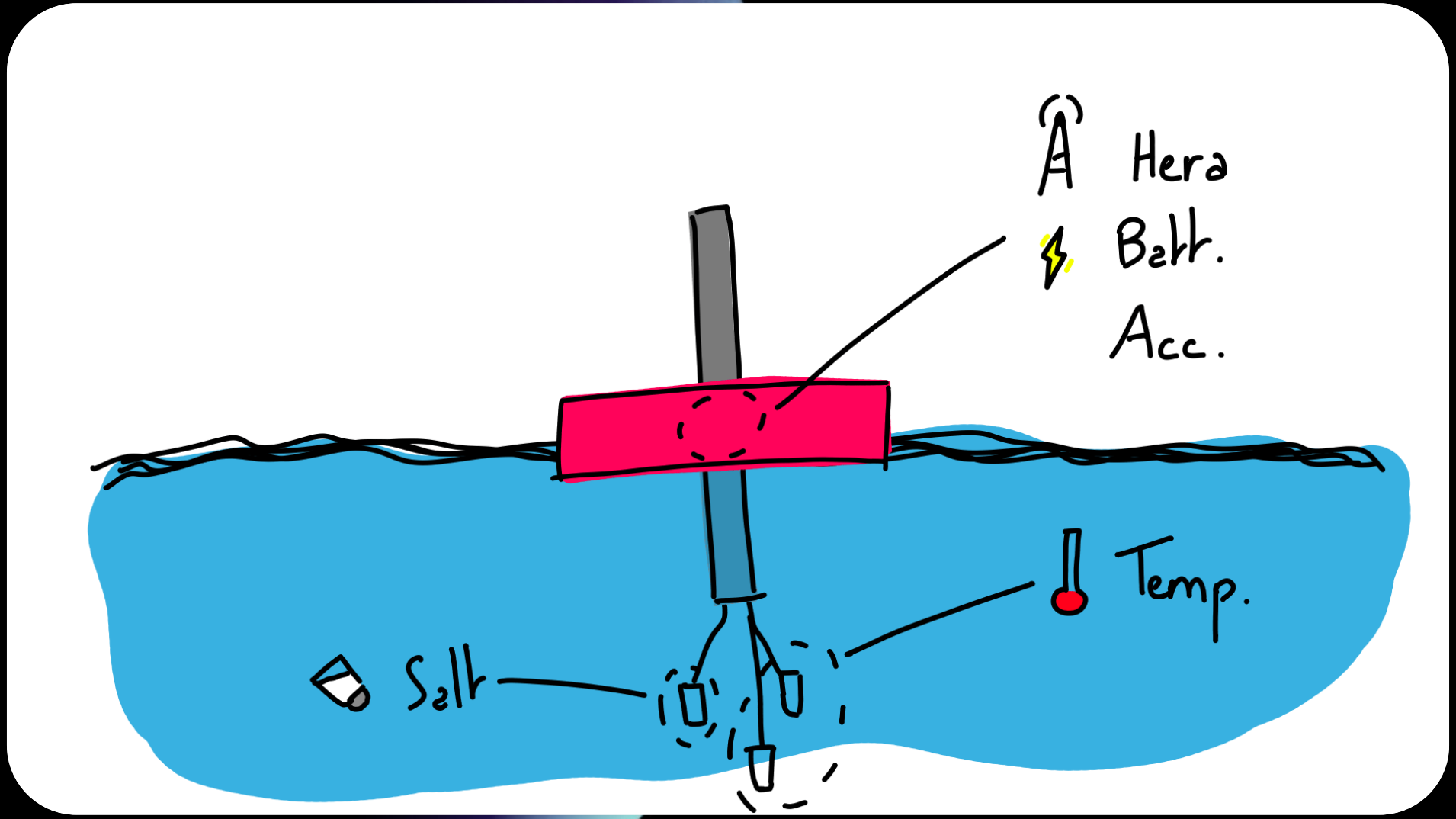



Jason 3
In orbit
Internet link
CNES
MONTEIL
HIGH SCHOOL
Hertzian transmission
of binary data
(Argos System)
Iris
In the sea
1. Receive data
2. Transfert to us
numeric data
2. Conversion (meters,
seconds, volts, Celsius, g/L
(salinity), % (humidity)
3. Interpretation

ELECTRONICS AND PROGRAMMING



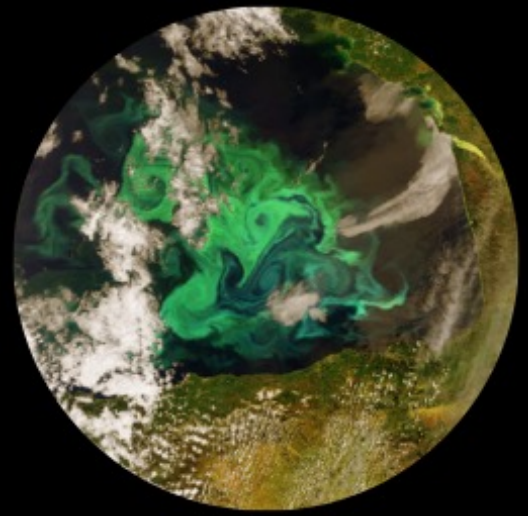
INSIDE THE BUOY



SENSORS

Temperature

On the surface
50m under the surface

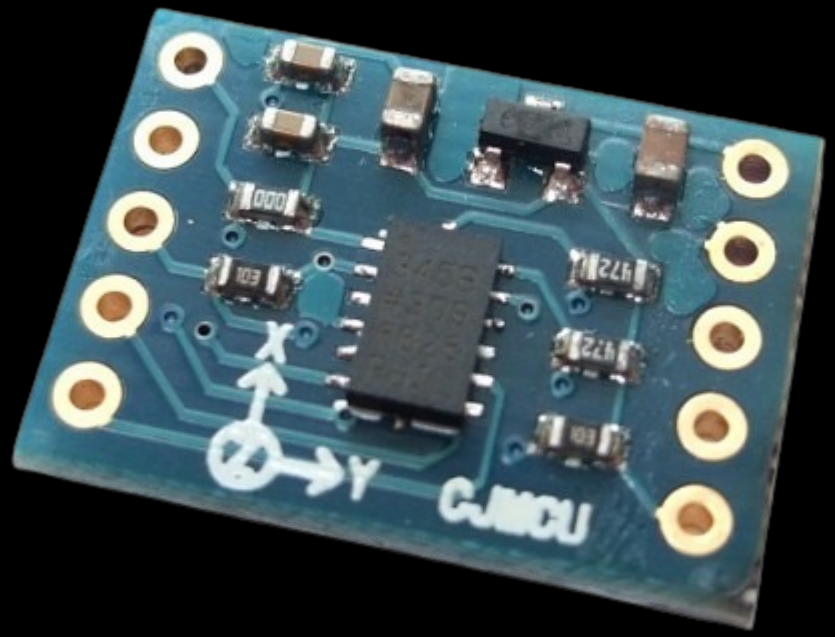


Chlorophyll

Maybe

Battery level

Battery wear

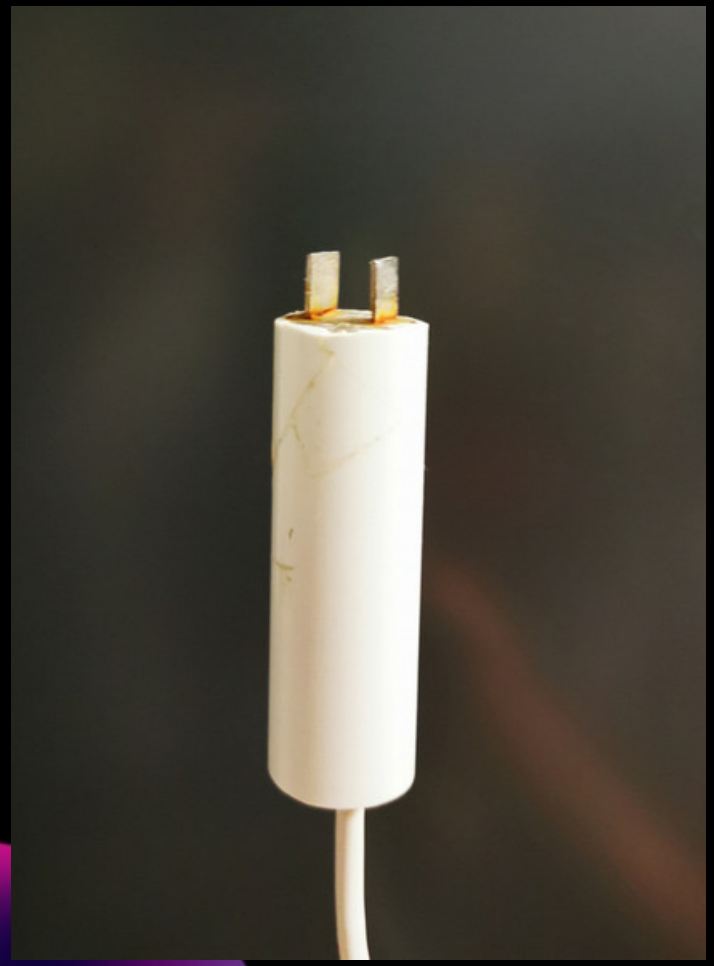


ACCELEROMETER

- Motion = Energy
- Computing wave's height
- Acceleration → Height

$$Hm = a \cdot \left(\frac{T^2}{4\pi^2} \right)$$

SALINITY SENSOR

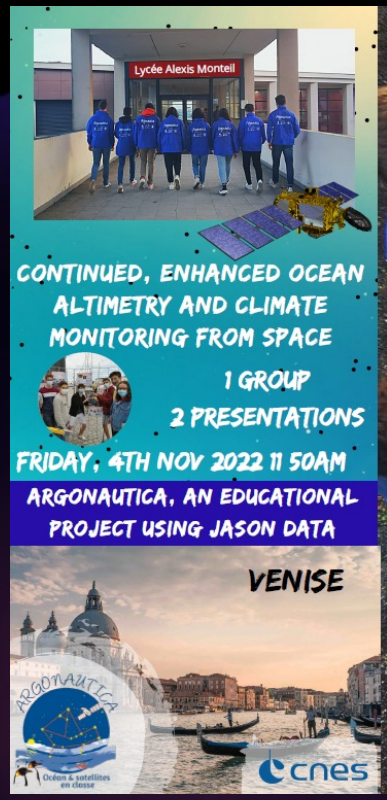


Home made sensor

Measure the conductance

Problem : Oxidization
Solution : Switch the poles

THANKS TO OUR SPONSORS



Atelier Mer et Espace

cnes
CENTRE NATIONAL D'ÉTUDES SPATIALES

ARGONAUTICA
Océan & satellites en classe

LAAS CNRS
INSTITUT CARNOT
LAAS CNRS

Monteil
développeur de talents

OBSERVATOIRE OCÉANOLOGIQUE de Banyuls/Mer 1882