

AI Chair OceaniX 2020-2024

Physics-informed AI for Observation-Driven Ocean AnalytiX

PI: R. Fablet, Prof. IMT Atlantique, Brest
Operating budget: ~2M€

Participating labs



Institutional partners



Industrial partners

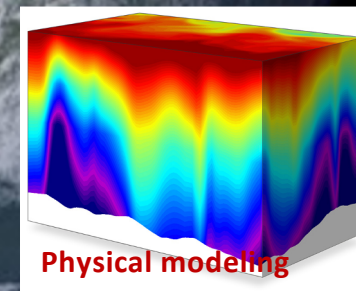
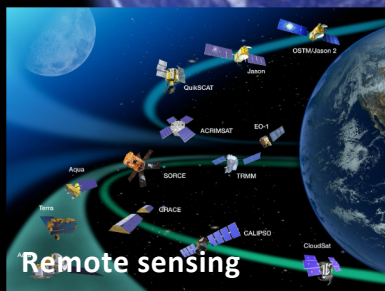


International partners



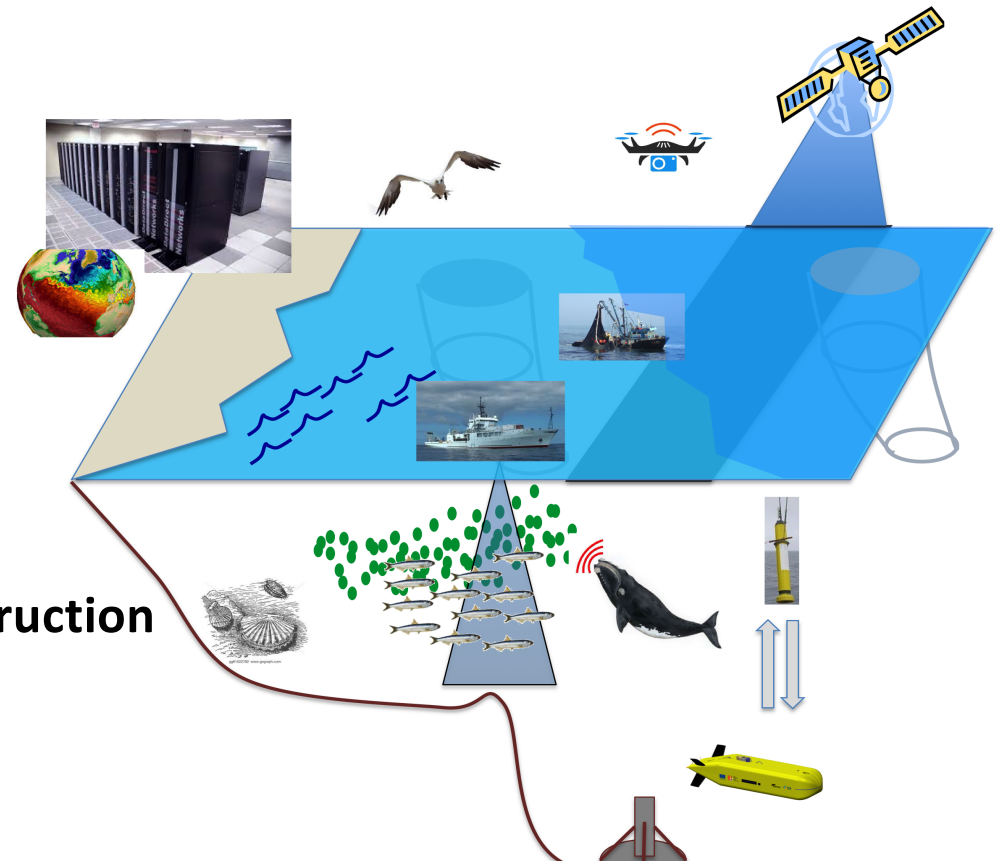
General objective

Bridging AI & Physics for the next-generation of self-adaptive multi-platform ocean monitoring and surveillance systems and services



Bridging physics & AI: Targeted breakthroughs

- Identification of governing equations
- Computational acceleration
- Improved inference, Forecasting & Reconstruction
- Smart multi-platform observing systems

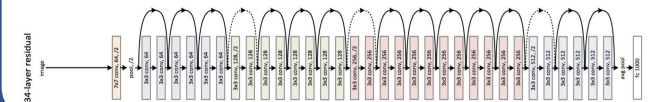


Physical model

$$\frac{\partial u}{\partial t} + \langle \nabla u, v \rangle = \kappa \Delta u$$

Physics-informed
Representation learning

Data-driven representation

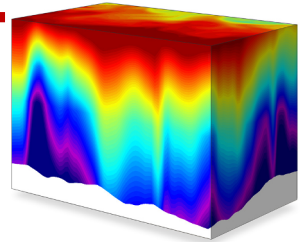


OceaniX Scientific Program

SO2. Smart AI-guided multi-platform ocean sensing systems

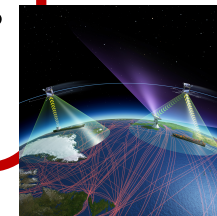


SO3. Modeling, forecasting and reconstruction of poorly-resolved upper ocean processes



SO1. Physics-informed NN representations of geophysical dynamical systems

SO4. Monitoring and surveillance of maritime activities from multi-source data



OceaniX team:

15 scientists
10 PhD scholarships
2 4-year postdocs

OceaniX Training & Animation Program

*Dual degree program
(MSc./eng.) Ocean-Data
Science between ENSTA
Br., IMT Atlantique &
UBO*



OceaniX

*Doctoral course &
Summer schools on
AI/Data Sc. & Ocean
Science*

ALLoHa

LES RÉSULTATS

«Advanced Living Lab for Ocean Hackers»
Data-Driven Innovation & Services for Ocean Sustainability

UN PROGRAMME D'ANIMATION OCTOBRE 2018 – DÉCEMBRE 2019



meetup



*Life-long training, co-
working sessions,
project-based training*

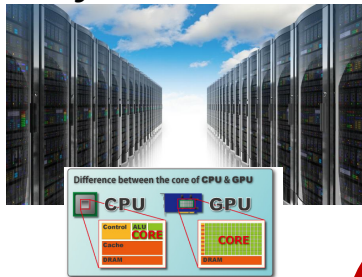


Data Sciences for Geosciences 2020

- Doctoral course, 27-31 January 2020, Toulouse, France -

From basic research to AI-driven innovation for ocean monitoring & surveillance

Storage & computing infrastructure



Development & Evaluation Sandbox

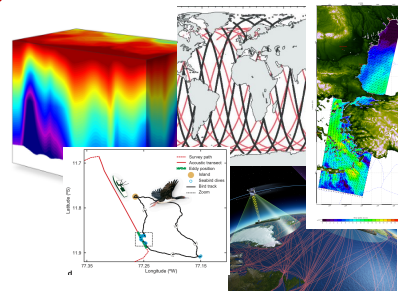


Ocean analytics sandbox

Dual AI-Ocean expertise



Marine data



Supporting actions:

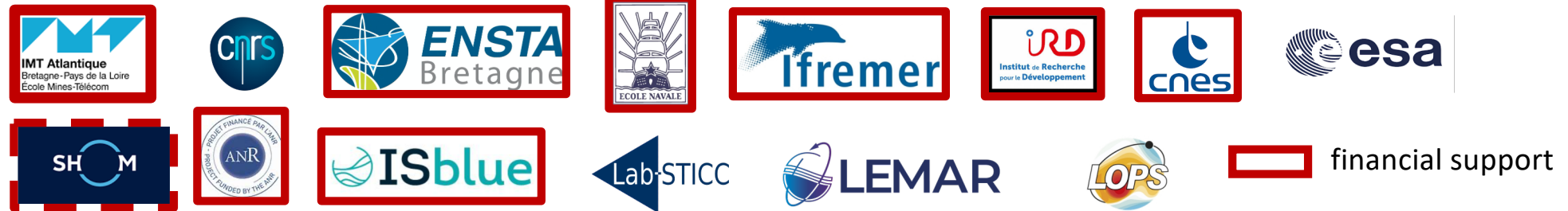
- Ifremer-IMT Atlantique-INRIA partnership on AI & Ocean
- CPER AIDA project
- CMM initiative ALLOHa

Specific OceaniX instruments

- Industrial support to OceaniX Phd scholarships
- Co-design of (open) OceaniX data challenges
- business-oriented POCs using ocean analytics sandbox
- 2-month interships («césure») of OceaniX PhD candidates

Partners/supports

- Institutional partners:



- Industrial partners



- International partners



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Ocean AnalytiX

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More information:

<https://rfablet.github.io/projects/2019-oceanix>

- Key messages**
- AI-driven paradigms for ocean monitoring and surveillance
 - Hybrid physics-AI schemes beyond “black-box”
 - Dual-expertise AI-Ocean training program (MSc., PhD.)
 - Research-Innovation Ocean Analytics Sandbox

