

ANR MeLODy

**Bridging geophysics and Machine Learning
for the modeling, simulation and reconstruction of Ocean Dynamics**

Project meeting, October 2020



Agenda

10h-10h30 Introduction & General Information

10h30-11h30 Focus on WP2 (learning & Extremes)

- Paul Platzer. Data assimilation and Extremes
- Philippe Naveau. KL measures for extremes

11h30-12h30 Focus on WP3 (Learning & Data Assimilation)

- Ronan Fablet, 4DVar and Variational NNs
- Duong Nguyen, Variational (Bayesian) deep learning and DA
- Maxime Beauchamp, Application to altimetry data

12h30-13h30 Lunch break

Agenda

13h30-15h00 Focus on WP1 (Learning & System Identification)

- Hugo Frezat. Physics-informed NNs for subgrid-scale modelling
- Eugène Kazantsev, Subgridscale and NNs
- Said Oula. Representation learning for partially-observed dynamics
- Patrick Gallinari, TBD

15h30-16h30 Focus on WP4 (Case-studies and evaluation)

- Julien Le Sommer, TBD
- Maxime Beauchamp, Data challenge SSH/SWOT

Redouane Lguensat, Case-study on tide-eddy separation in SSH data

16h30-17h30 Wrap-up and workplan

Specific objectives of the meeting

- Review ongoing work within each WP
- Review and decide tools and frameworks to make easier interactions, collaborations, data/code sharing within the project
- Specification of case-studies and evaluation frameworks (WP4) shared by WPs 1-3
- Organization of next AI4OAC workshop (June/July 2021?), with a doctoral course on Deep Learning for Geophysical Dynamics the preceding week ?
Organizing committee ?

Introduction & General Information

- New team members:
 - Nicolas Lafon, PhD WP2 (Learning & Extremes), starting on early 2021
 - Quentin Febvre, PhD WP3 (Learning & DA), starting on October 2020
 - Yicun Zhen, Postdoc WP2 (Learning & Extremes), starting on October 2020
 - PhD WP1 ?
 - Postdoc WP3 (2021?)
 - Postdoc WP1 (2021?)
- Animation / coordination:
 - Project website: <https://anr-melody.github.io/>
 - Github organization: <https://github.com/CIA-Oceanix> (code for preprints, private repos,...)
 - Melody & Slack: Melody channels in OceaniX slack workspace or specific Melody workspace ?
 - Data sharing: cloud storage on wasabi
 - Monthly journal club AI4Climate (<https://ai4climate.lip6.fr>) co-organized with Redouane (IPSL)
 - Monthly webinar starting on October (<https://cia-oceanix.github.io/webinar>)

Animation Melody 2020-2021

- **Proposed framework for the definition of Melody case-studies :**
 - Objectives (DL: June 2021, Melody's workshop):
 - Specify and implement Melody's case studies (2 to 4)
 - Implement a generic data challenge framework through SSH/SWOT case-study
 - Melody's case-studies on Geophysical Extremes (WP1/WP4): to be scheduled in november ?
 - Melody's case-studies on System Identification (WP1/WP4): late 2020 or early 2021 ?
 - Melody's case-studies on Data Assimilation (WP1/WP3): 1st quarter 2021
- **Project meetings:**
 - January 2021 (online): pool
 - April 2021 (online)
 - June/July 2021 -> annual workshop (face-to-face, possibly partly online)
 - October 2021 (online)
- **Webinar/journal club**
 - Monthly journal club AI4Climate (<https://ai4climate.lip6.fr>)
 - Monthly webinar starting on October (<https://cia-oceanix.github.io/webinar>)