

AI-TT workshop agenda overview

13th April - Day 1

09:15 Arrival and registration

09:40 Welcome, Gregory Smith and Rachel Furner

Block 1 talks: Ocean Emulators

Chair: Rachel Furner, Rapporteur: tbc

09:50 Toward Scalable and Probabilistic Neural Ocean Forecasting, *Simon Van Gennip (Mercator Ocean International)*

10:10 Application of Deep learning (DL) in the Gulf of St. Lawrence and Estuary, *Francois Roy (ECCC)*

10:30 AI-driven Nanming Model for Three-dimension Ocean Variable Forecasting, *Xiaoyan Li (Southern Marine Science and Engineering Guangdong Laboratory, Zhuhai)*

10:50 Prediction of sea surface currents around the Korean peninsula using artificial neural networks, *Jae-Hun Park (Department of Ocean Sciences, Inha University)*

11:15 Coffee

11:45 **Discussion session 1: Expectations and requirements for AI in Ocean prediction, and how can the task team best support this**

Chair: Gregory Smith, Rapporteur: Rachel Furner

12:45 Lunch - self pay at local restaurants

Posters

14:00 Poster flash talks: 2 mins from each author to introduce their poster.

14:15 Poster viewing and coffee

Chair: tbc

Filling the Ocean's Gaps: a Self-Supervised Neural Network for Argo Profiles Data Augmentation, *Teresa Tonelli, (OGS, University of Trieste)*

Assimilation of sea surface temperature in the Mediterranean Sea using ML-based operators, *Daniele Bigoni (CMCC Foundation, Italy)*

Detection and Discrimination of Marine Oil Spills and Look-alike Phenomena in Synthetic Aperture Radar Imagery, *Xudong Huang (Department of Oceanography, Dalhousie University)*

Machine Learning Forecast Correction for Geophysical Fields, *Jacopo Dall'Aglio (University of Bologna)*

Bridging Scales in Mediterranean Biogeochemical Prediction: A High-Order Ensemble Assimilation Coupled with AI-Driven Downscaling, *Simone Spada (OGS)*

Data-driven ocean modelling at ECMWF, *Rachel Furner (ECMWF)*

Block 2 talks: Observations and Data Assimilation

Chair: tbc, Rapporteur: tbc

15:15 Training end-to-end neural mapping schemes from simulation data for the reconstruction of global-scale sea surface fields, *Ronan Fablet (IMT Atlantique)*

15:35 Short-term neural forecasts of ocean dynamics from sparse satellite observations, *Daria Botvynko (IMT Atlantique)*

15:55 Two-Phase CNN for Model Data Fusion: Predicting 3D Chlorophyll-a in the Mediterranean Sea, *Teresa Tonelli (OGS, University of Trieste)*

16:15 A Deep-Learning Observation Operator for Subsurface Thermohaline Reconstruction from Satellite Surface Observations, *Geon Min Lee (Pukyong National University, Republic of Korea)*

16:35 AI perform on high resolution three-dimensional ocean forecasting: remote sensing data driven becomes a new possibility, *Liyang Wan (National Marine Environmental Forecasting Center)*

17:00 Optional pub trip

18:30 Optional (self pay) dinner at Trois Brasseurs on St. Denis

Block 3 talks: Emulators

Chair: tbc, Rapporteur: tbc

- 09:00 Linear Stochastic Emulators of the Ocean Circulation - A Lesson, perhaps, for Machine Learning, *Andrew Moore (University of California Santa Cruz)*
- 09:20 A data driven limited area storm surge model, *Mateusz Matuszak (Norwegian Meteorological Institute)*
- 09:40 A Physics Informed Emulator for Ocean Oxygen, *Annalisa Bracco (CMCC)*
- 10:00 Application and Verification of the Global Wave Intelligent Forecast Model, *Fang Hou (National Marine Environmental Forecasting Center)*
- 10:20 Development of machine-learning emulators for harbour-scale ocean prediction, *Michael Dunphy (Institute of Ocean Sciences, Fisheries and Oceans Canada)*

10:45 Coffee

Keynote

Chair: Fraser Davidson, Rapporteur: Kristian Mogensen

- 11:15 OceanBench: A Benchmark for Data-Driven Global Ocean Forecasting systems, *Anass El Aouni (Mercator Ocean International)*

12:15 Lunch - self pay at local restaurants

Block 4 talks: Downscaling, and other ML applications

Chair: Frederic Dupont, Rapporteur: tbc

- 13:30 Intelligent forecasting of marine environmental elements in the South China Sea, *Xueming Zhu (Southern Marine Science and Engineering Guangdong Laboratory, Zhuhai)*
- 13:50 From Coarse Models to Coastal Detail: A Deep Learning Approach to AI based Statistical Downscaling in the Adriatic Sea, *Leonardo Saccotelli (CMCC Foundation - Euro-Mediterranean Center on Climate Change)*
- 14:10 Integrated AI_Physics Approaches for Coastal Prediction Across the Open-to-Coastal Ocean Continuum, *Joanna Staneva (Helmholtz Zentrum HEREON)*
- 14:30 Fix the double penalty in data-driven forecasting by modifying the loss function, *Christopher Subich (Environment & Climate Change Canada)*
- 14:50 Variational autoencoder-based clustering for geophysical fluid circulations with small sample size, *Kunihiro Aoki (Meteorological Research Institute, Japan Meteorological Agency)*

15:15 Coffee

15:50 Discussion session 2: Benchmarking, assessment and validation of ML models

Chair: Rachel Furner, Rapporteur: Simon Van Gennip

16:50 Workshop wrap up

17:00 Close