Integrating Multidisciplinary Observations in Vent Environments (IMOVE) workshop - Brest, 23-25 November 2020

Build multidisciplinary collaborations across observatories

Monday 23

08h45: Connexion

09h10: Introduction

09h20: **EMSO Azores: From deep-sea observatory to environmental monitoring and ecosystem management.** P.M. Sarradin (Ifremer, France)

09h50: **Toward an integrated organization for EMSO Azores data management.** S. Van Iseghem (Ifremer, France)

Session 1. Crustal dynamics: plumbing system, thermo feed-back, hydrothermal circulation

Chair: Jean-Arthur Olive (CNRS, France) & Thibaut Barreyre (University of Bergen)

10h10: KEYNOTE – **From the magma chamber to the vents: an overview of geophysical monitoring of the Lucky Strike hydrothermal system.** M. Cannat (IPGP, France)

10h35: Break

10h50: **Multidisciplinary study of near seafloor hydrothermal circulations at Lucky Strike, Mid-Atlantic Ridge.** B. Wheeler (IPGP, France)

11h10: **Seafloor spreading on observatory time scales.** JA Olive (ENS/CNRS, France)

11h30: **Time and space variations of near seafloor seawater temperatures measured over the Tour Eiffel sulfide mound, Lucky Strike vent field, Mid-Atlantic Ridge.** M. Cannat (IPGP, France)

11h50: **Hydrothermal flow organization constrains ecosystem distribution: The Milos shallow-water hydrothermal system**. J. Escartin (ENS, France)

12h10: **A seismological study of the Lucky Strike volcano, Mid-Atlantic Ridge: constraints on crustal hydrothermal circulation patterns.** S. Bouhidar (IPGP, France)

12h30: Lunch break

13h45: HANDS-ON WORKSHOPS (restricted to registered attendees)

Time-series analyses. T. Crone (LDEO, US)

15h45: Break

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Session 2 Ecosystem response to environmental drivers/coupling at the floor/water interface

Chairs: Jozée Sarrazin, Marjolaine Matabos (Ifremer, France)

16h00: **TEMPO: 10 years of ecological observations.** L. Van Audenhaege (Ifremer, France)

16h20: **Biodiversity underestimation in our bLUe planEt: artificial intelligence (AI) REVOLUTION in benthic taxonomy- The BLUE REVOLUTION project -** C Borremans (Ifremer, France)

16h40: KEYNOTE – **TBD.** K. Juniper (University of Victoria, Canada)

17h15: Final discussion - END OF DAY 1 AT 17H30

Tuesday 24

9h00: Connexion

Session 3 Water-column and plume dynamics

Chairs: Florence Pradillon (Ifremer, France), Guillaume Roullet (UBO/LOPS, France)

09h15: KEYNOTE - **Advances and limitations of coupled bio-physical modelling to understand dispersal through deep sea waters.** F. Pradillon (Ifremer, France) & C. Vic

09h50: **HydrothermalFoam: 3-D hydro-thermo-transport model for natural submarine hydrothermal systems.** Z. Guo (GEOMAR, Germany)

10h10: **Vortex dynamics of a hydrothermal plume and its role in tracer dispersion.** G. Crystle (UBO, France)

10h30: *Flash presentation (poster)*: **Mineral-fluid-microorganism interaction in buoyant hydrothermal plume (EMSO-Azores: Lucky Strike hydrothermal field).** L. Artigue (CNRS, France)

10h40: Break

Feature. Outreach and social impact of observatories

Chair: Jozée Sarrazin & Ana Colaço

11h00: **10 years of outreach at EMSO-Azores.** J. Sarrazin (Ifremer, France)

11h40: **Deep Sea Spy: citizens screen the deep.** M. Matabos (Ifremer, France)

12h00: Lunch break

13h30: HANDS-ON WORKSHOPS (restricted to registered attendees)

A. **Modeling** (description below). Lars Ruepke (GEOMAR, Germany)
B. **Imagery analyses**. Aurélien Arnaubec (IFREMER, France)

15h30: Break

16h00: ROUND TABLE (restricted to registered attendees): Strategic working groups – Topic 1 (see below)

END OF DAY 1 AT 17H30

Topic of discussions for the breakout session groups
1. Define EOV/EBVs to be monitored with ridge observatory and establish standardized monitoring strategies (chairs: K Juniper - PM Sarradin)
2. Future direction for observing the ridge: evolution of observation systems (autonomous/cabled, fixed/mobile), new technology - what do we want? (Introduction talk by Ifremer on future observatories)
3. How to increase ocean literacy and inform stakeholders using observatories? (Chairs: A. Colaço - J. Sarrazin)

Wednesday 25

08h45: Connexion (restricted to registered attendees)

09h00: Continue breakout session discussions (break at 10h30) – Topic 2

Introduction talk on observatories technology. N. Lanteri, X. Bompais, J. Blandin (Ifremer, France)

10h30: Break

10h45: Breakout session discussions – Topic 3

12h00: Lunch break

13h30: Restitution and drafting white paper

END OF DAY 3 AT 16h00

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Hands-on workshops

Monday and Tuesday we propose3 hands-on workshop:

1. **Big data, time-series analyses tutorial** (Tim Crone, LDEO / Columbia University)
2. **Imagery** (A. Arnaubec, Ifremer, Toulon)
3. **Handling multi-scale data/modeling** (Lars Ruepke, GEOMAR) :

The modeling workshop will include hands-on exercises on hydrothermal system modelling designed to illustrate the full workflow from formulating testable predictions from geological and geophysical data, over running numerical simulations, to joint model-data interpretation. In these exercises, we will use our new open-source hydrothermal flow model hydrothermalFoam, which is based on the popular CFD platform openFOAM, plus (probably) some python/jupyter examples illustrating how the seawater equation-of-state can be queried to understand phase separation phenomena.

www.openfoam.org

www.hydrothermalfoam.info

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