



Gas Hydrate Modeling Workshop

27.11 - 29.11.2023, 9 a.m. - 3 p.m.

MARUM room 2070

Cluster of Excellence 'The Ocean Floor - Earth's Uncharted Surface'

MARUM Center for Marine Environmental Sciences

University of Bremen

Bremen, Germany

Workshop schedule

| | Monday, 27th of November | Tuesday, 28th of November | Wednesday, 29th of November |
|-------|---|--|---|
| 09:00 | Welcome & introduction of participants | Invited talk #1 <u>Dr. Livio Ruffine</u> (Ifpen) - Phase Transitions in Gas Hydrate Experiments | Invited talk #2 <u>Dr. Taylor Lee</u> (U.S. NRL) - Machine Learning Methods in Gas Hydrate Predictions |
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| | <u>Dr. Ewa Burwicz-Galerne</u> - Modelling Natural Gas Hydrate Systems | Discussion #1 | Discussion #2 |
| 10:00 | <u>Dr. Shubhangi Gupta</u> - Modeling Gas Hydrate Cyclicity | Exercise block #3 - Phase transitions governed by the model - Solubility curves | Exercise block #5 - Types of mathematical model solutions (steady-state, cyclic, chaotic, chaos) |
| | <i>Coffee break</i> | | |
| | Exercise block #1 | | |
| 11:00 | - Setting up Virtual Machines (SG) | <i>Coffee break</i> | <i>Coffee break</i> |
| | - How to design and run simulations (SG) | Exercise block #3 cont. - Kinetic controls of reactions | Exercise block #5 cont. - How to analyze cyclicity as a model output |
| | - Exemplary run: steady-state case | | |
| 12:00 | <i>Lunch break</i> | <i>Lunch break</i> | <i>Lunch break</i> |
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| 13:00 | Exercise block #2 | Exercise block #4 | Exercise block #6 |
| | - Exemplary run: cyclic solutions | - Exemplary run: results dependent on the reaction rates between phases | - Sensitivity of modeling solution to external triggers |
| | - Thematic: Free gas migration | - Cyclic states in shallow sediments vs. cyclic states close to the BSR depths | |
| 14:00 | - Thematic: 'gas hydrate nozzle' effect | | |
| | | | Official wrap-up and future perspectives |

| 15:00 | <i>End of the official daily programme</i> | <i>End of the official daily programme</i> | <i>End of the official daily programme</i> |
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| ... | | | Post-workshop meeting regarding contributions to the <i>Special Issue in Frontiers: Environment</i> and further discussions. |
| ... | | | |
| 18:00 | | <i>Invited dinner for all participants</i> | |
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| 20:00 | | | |