

## ECORD Summer School Subseafloor fluid flow and gas hydrates

Venue: MARUM, University of Bremen, Germany

September 12 – 23, 2011

### Monday

	<b>September 12</b>
09:00 - 09:45	<b>Welcome and introduction to the Summer School, <i>Gerhard Bohrmann, Dierk Hebbeln</i></b>
	<b>Fluid flow at continental margins</b>
09:45 - 10:45	Fluid flow at active continental margins; <i>Erwin Suess</i>
10:45 - 11:15	Coffee break
11:15 - 11:45	Continuation <i>Erwin Suess</i>
11:45 – 13:00	Fluid flow at passive continental margins; <i>Gerhard Bohrmann</i>
13:00 - 14:30	Lunch
14:30 - 15:30	<b>IODP and ECORD:</b> Structure and objectives and an introduction to “Virtual ship”; <i>Ulla Röhl and Jochen Erbacher</i>
15:30 - 16:00	IODP Core curation; <i>Walter Hale</i>
16:00 - 16:30	Tea break
16:30 - 17:30	<b>Guided tour through MARUM and IODP Bremen Core Repository (BCR)</b>
17:45	<b>Icebreaker party</b>

### Tuesday

	<b>September 13</b>
	<b>Fluid flow at continental margins</b>
09:00 - 09:15	Review of previous day's material by participants
09:15 - 10:30	Biology and chemosynthetic life at cold seeps; <i>Heiko Sahling</i>
10:30 - 10:45	<b>Photo shooting:</b> Group photo of all participants
10:45 - 11:15	Coffee break
11:15 - 12:45	Fluid flow of mud volcanoes; <i>Tom Feseker</i>
12:45 - 14:00	Lunch
14:00 - 15:00	Presentations by participants
15:00 - 15:45	<b>Virtual ship: Marine heat flow measurements – introduction to laboratory exercise #1; <i>Tom Feseker</i></b>
15:45 - 16:15	Tea break
16:15 - 17:00	<b>Virtual ship: Gas hydrates – introduction to laboratory exercise #2; <i>Thomas Pape</i></b>
17:00 - 17:45	<b>Virtual ship: Core description – introduction to laboratory exercise #3; <i>Mahyar Mohtadi</i></b>

<b>Wednesday</b>	<b>September 14</b>
	<b>Gas hydrates</b>
09:00 - 09:15	Review of previous day's material by participants
09:15 - 10:00	Basics in gas hydrates, gas chemistry, stability and phase boundaries; <i>Gerhard Bohrmann</i>
10:00 - 10:45	Seismic evidence for gas hydrates; <i>Michael Riedel</i>
10:45 - 11:15	Coffee break
11:15 - 12:00	25-years marine gas hydrate research; <i>Erwin Suess</i>
12:15 - 12:45	Methane hydrate budgets by modeling; <i>Matthias Haeckel</i>
12:45 - 14:00	Lunch
14:00 - 15:00	Presentations by participants
15:00 - 15:30	Tea break
	<b>Virtual ship</b>
	<b>Heat flow, gas hydrates, and visual core description</b>
	<b>Three groups of 8 students rotate for three laboratory sessions</b>
	Laboratory #1: Heat flow (Tom Feseker)
	Laboratory #2: Gas hydrates (Thomas Pape)
	Laboratory #3: Core description (Mahyar Mohtadi)
15:30 - 18:00	<b>Virtual ship - first laboratory session - laboratory #1 to #3</b>
<b>Thursday</b>	<b>September 15</b>
	<b>Gas hydrates</b>
09:00 - 09:15	Review of previous day's material by participants
09:15 - 10:45	Gas hydrate-pore water interactions, isotopes and gas hydrate carbonates <i>Erwin Suess</i>
10:45 - 11:15	Coffee break
11:15 - 12:45	Production tests and CO <sub>2</sub> exchange in methane hydrates; SUGAR project; <i>Matthias Haeckel</i>
12:45 - 14:00	Lunch
14:00 - 15:00	Presentations by participants
15:00 - 15:30	Tea break
15:30 - 18:00	<b>Virtual ship - second laboratory session - laboratory #1 to #3</b>
<b>Friday</b>	<b>September 16</b>
	<b>Gas hydrates</b>
09:00 - 09:15	Review of previous day's material by participants
09:15 - 10:00	Past climate change, PETM; <i>Erwin Suess</i>
10:00 - 10:45	Drilling gas hydrate in India, Korea; <i>Michael Riedel</i>
10:45 - 11:15	Coffee break
11:15 - 12:00	Advanced seismic methods to detect gas hydrates; <i>Michael Riedel</i>
12:00 - 12:45	Quantification of methane hydrates in sediments; <i>Gerhard Bohrmann</i>
12:45 - 14:00	Lunch
14:00 - 15:00	Presentations by participants
15:00 - 15:30	Tea break
15:30 - 18:00	<b>Virtual ship - third laboratory session - laboratory #1 to #3</b>

<b>Saturday</b>	<b>September 17</b>
09:00 - 09:15	Review of previous day's material by participants
09:15 - 10:45	Presentations by participants
10:45 - 11:15	Coffee break
11:15 - ~13:00	Presentations by participants
	<b>Afternoon free</b>
<b>Sunday</b>	<b>September 18</b>
	<b>Free time to explore Bremen</b>
<b>Monday</b>	<b>September 19</b>
06:00 - 20:00	<b>Full day research cruise with R/V ALKOR to seeps in the Baltic Sea; Gerhard Bohrmann</b>
<b>Tuesday</b>	<b>September 20</b>
	<b>Hydrogeology of the ocean crust</b>
09:00 - 10:30	Fluid rock interactions of the oceanic lithosphere; <i>Nils Jöns</i>
10:30 - 11:00	Coffee break
11:00 - 12:30	Hot Vents/Energy and mass transport at hydrothermal vent fields; <i>Katja Schmidt</i>
12:30 - 14:00	Lunch
14:00 - 15:30	<b>Virtual ship: Introduction to downhole logging; Sarah Davies</b>
15:30 - 16:00	Tea break
16:00 - 16:45	<b>Virtual ship: Deriving heat flow from Bottom Simulating Reflectors – introduction to laboratory exercise #4; Heiner Villinger</b>
16:45 - 17:30	<b>Virtual ship: Pore water sampling – introduction to laboratory exercise #5; Luzie Schnieders</b>
<b>Wednesday</b>	<b>September 21</b>
	<b>Hydrogeology of the ocean crust</b>
09:00 - 09:15	Review of previous day's material by participants
09:15 - 10:45	Biogeochemistry and fluid flow; <i>Verena Heuer and Tim Ferdelmann</i>
10:45 - 11:15	Coffee break
	<b>Subseafloor fluid flow and deep biosphere</b>
11:15 - 12:45	Hydrothermal circulation at ridge flanks and seamounts; <i>Heiner Villinger</i>
12:45 - 14:00	Lunch
	<b>Virtual ship</b>
14:00 - 14:45	<b>Virtual ship: Physical properties - introduction to laboratory exercise #6; Michael Riedel</b>
14:45 - 15:15	Tea break
	<b>Virtual ship</b>
	<b>Heat flow from BSRs, pore water sampling, and physical properties</b>
	<b>Three groups of 8 students rotate for three laboratory sessions</b>
	Laboratory #4: Heat flow from BSRs (Heiner Villinger)
	Laboratory #5: Pore water sampling (Luzie Schnieders)
	Laboratory #6: Physical properties (Michael Riedel, Holger Kuhlmann)
15:15 - 17:45	<b>Virtual ship - fourth laboratory session - laboratory #4 to #6</b>

**Thursday**

09:00 - 11:30  
11:30 - 13:00

13:00 - 14:30

14:30 - 15:00

15:00 - 17:30

17:45

**September 22**

**Virtual ship - fifth laboratory session - laboratory #4 to #6**

Lunch break

**Hydrogeology of the ocean crust**

CORKs: Monitoring fluids in the ocean crust; *Heiner Villinger*

Tea break

**Virtual ship - sixth laboratory session - laboratory #4 to #6**

**Farewell party at the Café Unique**

**Friday**

09:00 - 10:30

10:30 - 11:00

11:00 - 12:00

12:00 - 12:30

**September 23**

**How to write an IODP proposal; *Ulla Röhl et al.***

Coffee break

**How to write an IODP proposal - continued**

**Summer School debriefing, award for the best student presentation, and farewell**

*ECORD Mission Specific Platforms*