1st FRESCO Summer school

Living benthic foraminifera in coastal environments

2nd - 7th of July 2017

LPG-BIAF, Angers University

(France)

Description:

The first FRESCO Summer School addresses a wide array of innovative interdisciplinary research tools used in coastal foraminiferal studies. The summer school offers a combination of theoretical and practical courses and a field excursion. After a common part dealing with foraminiferal biology, ecology and the biogeochemical functioning of coastal environments, two optional topics are proposed: **1) integrated experimental approaches (IEA)** **2) bio-monitoring (BM).**

Option 1 (IEA) "integrated experimental approaches", aims to familiarize the participants with multidisciplinary experimental and field-based tools to study highly complex coastal environments, focusing on the role of foraminifera in biogeochemical cycles.

Option 2 (BM) "biomonitoring", taught by members of the FOBIMO consortium, will treat the various methods to determine marine ecosystem quality, focusing on methods recently developed for foraminifera.

Sunday, July 2nd, 2017 (17:00)**: Welcome speech, course presentation & ice breaker party** – Hall of the building A & *Amphi A*			
Monday, July 3rd	8:30-12:00	Lecture: **Overview of biological aspects of foraminifera** – *Amphi A* Generalization - What is a foraminifer ? (J. Bernhard, *WHOI, USA)* Reproduction and life cycle (P. Heinz, *Vienna University, Austria)* Trophic mechanisms, case studies (H. Nomaki, *JAMSTEC, Japan &* P. Heinz, *Vienna University, Austria)* Other physiological functions: growth, locomotion… (P. Heinz, *Vienna University, Austria)*	
	13:30-18:00	Lecture: **Coastal benthic foraminifera: habitats and ecology** – *Amphi A* Foraminifera in subtidal coastal environments (J. Schönfeld, *GEOMAR, Germany)* Mudflat functions (B. Jesus, *MMS Nantes*) & Foraminiferal distribution in transitional environments (E. Geslin, *LPG-BIAF Angers, France*) Field trip presentation (H. Howa, *LPG-BIAF Angers, France*)	
Tuesday, July 4th	5:45-12:30	**Field trip, Bay of Bourgneuf (La Couplasse) (French Atlantic coast):** Sampling cores / Functioning of Bourgneuf Bay	
	14:00-18:00	Option IEA: Practical courses in groups – *Building F* - Group A: Core sampling preparation – CTG labelling - Group B: Living foraminifera – Respiration rates - Group C: Sediment geochemistry – O2 profiling - Group D: Feeding experiment	Option BM: Practical courses on Bourgneuf Bay samples – *Building F* - Sample preparation: washing & sieving - Group A: Grain size analysis with a Malvern Mastersizer - Group B: Geochemistry: oxygen profile / data modeling - Group C: Density separation methods
Wednesday July 5th	8:30-12:00	Lecture: **Characterisation of the foraminiferal microhabitats: Early diagenesis** – *Amphi A* (E. Metzger, *LPG-BIAF Angers, France* & N. Risgaard-Petersen, *University of Aarhus, Denmark)*	
		Option IEA: Lecture – *Room A116* **Foraminiferal microhabitats: Intertidal environments** (E. Metzger & A. Mouret, *LPG-BIAF Angers, France)*	Option BM: Lecture – *Room A020* **Principles of biomonitoring** (E. Alve, *Oslo University Norway* & F. Jorissen, *LPG-BIAF Angers, France)*
	14:00-18:00	Option IEA: Practical courses in groups – *Building F* - Group D: Core sampling preparation – CTG labelling - Group A: Living foraminifera – Respiration rates - Group B: Sediment geochemistry – O2 profiling - Group C: Feeding experiment	Option BM: Practical course – *Building G – Room G002* - sample treatment, Rose Bengal staining criteria (on samples collected on the French Atlantic coast) - Biomonitoring exercise part 1: – Study Rose Bengal stained samples samples from the French Mediterranean coast
	18:30-20:00 Social event – *Room "Rez de Jardin" – Building L*		
Thursday, July 6th	8:30-12:00	Lecture: **Metabolism and genetics** – *Amphi A* Genetics and Barcoding (M. Schweizer, *LPG-BIAF Angers, France)*	
		Option IEA: Lecture: **Foraminiferal metabolism** – *Room A116* - Microaerophilic metabolism (Endo/ectosymbionts, deep kleptoplasty) (J. Bernhard, *WHOI, USA)* - Heterotrophic anaerobic metabolism (denitrification), (N. Risgaard-Petersen, *University of Aarhus, Denmark)* - Mixotrophic metabolism (T. Jauffrais and E. Geslin, *LPG-BIAF Angers, France)*	Option BM: Lecture: **Ecological indices and marker species** – *Room A117* - Principles (E. Alve, *Oslo University Norway*, & F. Jorissen, *LPG-BIAF Angers, France)* - Selection of ecological marker species, Atlantic Ocean (E. Alve, *Oslo University Norway*, & J. Schönfeld, *GEOMAR, Germany)* - Selection of ecological marker species, Mediterranean (F. Jorissen, C. Barras & M.-P. Nardelli, *LPG-BIAF Angers)*
	14:00-18:00	Option IEA: Practical courses in groups – *Building F* - Group C: Core sampling preparation – CTG labelling - Group D: Living foraminifera – Respiration rates - Group A: Sediment geochemistry – O2 profiling - Group B: Feeding experiment	Option BM: Practical course – *Building G – Room G002* - Biomonitoring exercise part 2: Study Rose Bengal stained samples from the French Mediterranean coast - Biomonitoring exercise part 3: analysis of the data base, calculate biotic indices
Friday, July 7th	8:30-12:00	Option IEA: Practical courses in groups – *Building F* - Group B: Core sampling preparation – CTG labelling - Group C: Living foraminifera – Respiration rates - Group D: Sediment geochemistry – O2 profiling - Group A: Feeding experiment	Option BM: Lecture: **Case studies of biomonitoring** – *Room A020* - Norwegian fjords, E. Alve, *Oslo University Norway* - French Mediterranean coast C. Barras, *LPG-BIAF Angers, France* - Tropical reef ecosystems, S. Spezzaferri, *University of Fribourg, Switzerland* - Oil drilling platforms, F. Jorissen, *LPG-BIAF Angers.* - Deep-sea mining, P. Nardelli, LPG-BIAF
	14:00-18:00	Option IEA: Synthesis of practical courses – *Room A 018* - Data analysis and presentation preparation - Presentation and open discussion	Option BM: Practical course - Biomonitoring exercise part 4: Data interpretation, preparation synthesis – *Room G002* - Biomonitoring exercise part 5: Oral presentation results, discussion and synthesis – *Room A020*

Further information: fresco.univ-angers.fr/en