International School on Foraminifera

6th Course

Urbino, 4-18 June, 2013

First Circular

Course Description

The 6th Course on Foraminifera is designed to provide an overview of the Taxonomy, Ecology, Biodiversity and Geological History of Benthic and Planktonic Foraminifera. This intensive course is intended for students interested in Micropalaeontology, Palaeoceanography, Palaeoecology, and Climate History. The aim is to provide a primer on the study of foraminifera and examples of how foraminifera can be used as paleoenvironmental and palaeoceanographical proxies. We review the current classification schemes of the foraminifera, discuss Ecology and Life History, review their usefulness for Biostratigraphical applications, and use case studies to investigate the geological history of the group with lab sessions.

Course Structure

Three distinct courses are planned: Larger Benthic Foraminiferal Course (5-9 June), Smaller Benthic Foraminiferal Course (10-14 June) and Planktonic Foraminiferal Course (15-18 June).

Teaching Format

The course consists of lectures and practical classes covering the taxonomy, distribution, and ecology and paleoecology of foraminifera. Microscope lab sessions provide the opportunity for participants to learn the foraminiferal genera and species, and view Cretaceous to Neogene foraminiferal assemblages from Petroleum Exploration areas and ODP sites as well as Quaternary and modern assemblages. Course materials include numerous reprints of classic papers, distributed on digital format.

Courses Outline

4 June Tuesday Icebreaker Party

Larger Benthic Foraminifera

Day 1 (5 June Wednesday)

Definition, biology and taxonomy of LBF: species concept and classifications
Biostratigraphic frameworks: evolutionary tendencies and fossil associations
Applications of LBF: Ecology and taphonomic signals
Functional morphology of LBF: actuopalaeontological approach
Upper Palaeozoic shallow water Fauna: the Fusulinina Suborder
Lab: hydrodynamics of nummulitids

Day 2 (6 June Thursday)

Jurassic to Cretaceous Larger Agglutinated Foraminifera
Lab: Jurassic to Cretaceous Larger Agglutinated Foraminifera

Day 3 (7 June Friday)

The Cenozoic LBF systematic groups
Introduction to Palaeogene LBF: biogeography and provinces
Early evolution in the Paleocene: agglutinated, porcelanaceous and hyaline
The LBF turnover and the Eocene-Oligocene boundary
The Eocene biodiversity (I): the genus *Alveolina*
The Eocene biodiversity (II): the genus *Nummulites*
Lab: classifications techniques, biometry and thin sections

Day 4 (8 June Saturday)

The nummulite bank: characterization, ecology and biostratinomy
The Eocene biodiversity (III): the orthophragminids
Oligo-Miocene fauna
Distribution of recent LBF
Diversity and applications on recent LBF
Lab: Micro Computed Tomography on recent LBF

Day 5 (9 June Sunday)

Day off

Smaller Benthic Foraminifera

Day 6 (10 June Monday)

Review of benthic Foraminiferal Suborders
Morphology and Classification of benthic Foraminifera
Morphogroups and functional morphology
Ecology and Distribution of benthic Foraminifera
Lab: Data bases, Taxonomy of benthic foraminiferal suborders

Day 7 (11 June Tuesday)

Community Structure, Life History, and Reproduction
Oceanographic proxies, benthic foraminiferal microhabitats, and productivity/oxygenation
Benthic foraminifera and water mass properties
Atlantic and Mediterranean shallow water benthic Foraminifera
Lab: Modern smaller benthic foraminifera: Foraminiferal genera and assemblages

Day 8 (12 June Wednesday)

Biostratigraphy and Paleoecology of benthic foraminifera
The ODP record, K/Pg and E/O boundaries
Lab: A review of late Cretaceous to Paleogene faunas

Day 9 (13 June Thursday)

Cenozoic Paleoceanographic events and smaller benthic foraminifera
Neogene of West Africa, and Gulf of Mexico: The ACEX Arctic Drilling Expedition
Lab: The Paleogene record; North Sea, Trinidad, Angola, Carpathians, Gubbio
A review of Jurassic to late Cretaceous faunas, Bering Sea Pleistocene faunas

Day 10 (14 June Friday)

Morning field excursion
Afternoon tourist visit
Social Dinner

Planktonic Foraminifera

Day 10 (15 June Saturday)

Introduction to Planktonic Foraminiferal Classification
Modern Planktonic Foraminifera
Taxonomy of modern planktonic foraminifera
Structure of cytoplasm, Feeding, symbiont and growth
Reproductive, seasonal, and diurnal cycles depth habitats

Origin of Planktonic Foraminifera
Biogeography of planktonic foraminifera
Faunal Provinces, Climatic Zones and Water Masses
Lab: Recent assemblages - wall structures - morphometric

Day 11 (16 June Sunday)

Neogene Planktonic Foraminifera
Miocene and Pliocene Planktonic Foraminifera
Pleistocene Planktonic Foraminifera
Biochronology and Zonal schemes
Lab: Miocene index species - Pliocene-Pleistocene index species

Day 12 (17 June Monday)

Mesozoic Planktonic Foraminifera
Biostratigraphy
Notes on Paleoceanography
Lab: Upper Jurassic to Maastrichtian

Day 13 (18 June Tuesday)

Cenozoic Planktonic Foraminifera
Biostratigraphy
Notes on Paleoceanography
Lab: Paleogene index species
Aperitif

Min number of participants: 10

Final deadline May 11th, 2013

Registration fees

Early registration (application sent and payment before February 9th, 2013)

PhD/MSc Students:	
One course	£ 290
Two courses	£ 450
Full courses	£ 570
Academic/Industrial staff :	
One course	£ 380
Two courses	£ 600
Full courses	£ 750

Late registration (application and payment sent after February 9th, 2013)

PhD/MSc Students:	
One course	£ 330
Two courses	£ 540
Full courses	£ 700
Academic/Industrial staff :	
One course	£ 430
Two courses	£ 710
Full courses	£ 860

The fee includes:

- lectures (4-day course)
- lecture notes
- icebreaker party
- refreshments
- aperitif
- excursion (for benthic and planktonic course)
- social dinner (for benthic and planktonic course)

How to make an application
Registration must be done by submitting the application form to fabrizio.frontalini@uniurb.it or by fax to (+39) 0722 304220.

Correspondence and Information:

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Lectures
Prof. Michael A. Kaminski, King Fahd University of Petroleum & Minerals (Saudi Arabia)
Dr. Fabrizio Frontalini, Urbino University (Italy)
Prof. Laia Alegret, University of Zaragoza (Spain)
Dr. Claudia Cetean, Fugro Robertson Ltd (UK)
Prof. Maria Rose Petrizzo, Milano University (Italy)
Prof. Cesare Andrea Papazzoni, University of Modena e Reggio Emilia (Italy)
Prof. Rodolfo Coccioni, Urbino University (Italy)
Prof. Geraint Wyn Hughes, King Fahd University of Petroleum & Minerals (Saudi Arabia)
Prof. Johann Hohenegger, University of Vienna (Austria)
Dr. Antonino Briguglio, University of Vienna (Austria)
Dr. Sev Kender, British Geological Survey (UK)

Requirements
The course is primarily intended for young researchers at the PhD or MSc stages of their careers and industrial staff working with Foraminifera, Meiofauna, Micropalaeontology, Paleoceanography, Paleoecology, Climate History. Applicants will primarily be selected on the basis of the relevance of the course for their current work.

Location
The course will be held in Urbino at the “Collegio Internazionale”. The “Collegio Internazionale” is in the historic center of Urbino.

Accommodation and meal
It is possible for participants to accommodate at the “Collegio Internazionale” (University Hall). Most of the rooms are double and have en-suite bathrooms, only few single rooms are available and will be assigned in enrollment order. The rooms are furnished, clean and comfortable. The cost of the accommodation is € 18 in double and € 25 in single per night including breakfast. The accommodation cost would be paid upon your arrival in cash or by debit/credit card directly to the reception desk of Collegio Internazionale (please visit, http://www.collegiointernazionaleurbino.it/en/1/galleria-immagini.html). Lunch and dinner are free, but meals may be obtained by a rechargeable card (it will provided a personal card for any participant) at the nearby university residential block in the "Mensa del Duca" (1-minute walking from Collegio Internazionale). The cost is either € 10 for a complete meal (first course, second course, side dish, bread, fruit and water) or € 6 for a meal (main course, two side dishes, bread, fruit and water).

The second circular with detailed information about the course is scheduled to be distributed on early March 2013 and will be sent to people who answered the first one.

We look forward to seeing you in Urbino!

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Last year's report….5th International School on Foraminifera – Urbino, Italy, 10th – 20th June 2012

by SIMON D'HAENENS, UNIVERSITY OF LEUVEN, BELGIUM

This June, for about two weeks, the streets of Urbino were filled with foram-enthusiasts for obvious reasons… With its 5th installment, the renowned *International School on Foraminifera* attracted many students and professionals from Africa, Asia, Europe, South America and the USA, eager to learn about these awesome little critters. Students included people various stages in their academic careers (bachelor to post-doc level) as well as industrial micropalaeontologists. Their interests spanned the entire stratigraphic record, from Cretaceous to Recent. Organized by Fabrizio Frontalini of the University of Urbino and Mike Kaminski of the King Fahd University of Petroleum & Minerals, and under the auspices of, and with sponsorship of the Grzybowski Foundation, this course provides a state-of-the-art overview on foraminifera and their use in biostratigraphy, ecology, (paleo)environmental reconstructions, climate studies and modern applications of benthic foraminifers in anthropogenically impacted environments. These topics were presented by Mike and Fabrizio, with the assistance of several guest lecturers: Laia Alegret (University of Zaragoza, Spain), Claudia Cetean (Fugro Robertson Limited) and Maria Rose Petrizzo (University of Milano, Italy).

The picturesque medieval city of Urbino is draped atop a hill, providing stunning panoramic views of the foothill landscape surrounding it. Undoubtedly equally beautiful is the local architecture and art: as a World Heritage Site, Urbino is known for its exceptional legacy of independent Renaissance culture under the patronage of Federico da Montefeltro, the duke of Urbino in the 15th Century. Low cost accommodation for applicants was provided in the modern and luxurious Collegio Internazionale located in the city centre, only a stone's throw away from the Piazza della Repubblica, which can be considered as the social hub and main "gelato" provider of Urbino. Speaking of food, although the campus had a great cafeteria, many students opted to explore the numerous marvelous restaurants in the city center, as recommended by some more-experienced members. The on-campus accommodation had many benefits: not only did it allow for intense professional networking and fruitful discussions to be continued after-hours, but it was also an ideal way to meet up to go for dinner, amble around town and its surrounding fields, watch the European Football Championship games or explore the infamous local pubs at night.

The course itself consists of two parts, one dealing with benthic and the other with planktic foraminifera. They can be regarded as two separate entities that function independently, but most participants opted to follow both. Each course was constructed in a similar way, with lectures in the morning and microscope sessions in the afternoon. The lectures started off with basic taxonomic and morphological concepts, only to quickly delve into more complex matters, well-illustrated with many case studies taken from the literature and personal experiences of the lecturers. This clever construction of the course made sure that it appealed to both amateurs as well as veterans in the field. The interactive and spontaneous nature of the classes was also reflected in the

fact that students got the opportunity to present personal work, complementing the topic of the day. The microscope sessions were set up as an independent study time, but always ended up being interactive with lots of discussions and cooperation among students and lecturers. Samples from the lecturers' extensive personal reference collections were available, as were reprints of a plethora of classic papers and books. This allowed for each student to fine-tune their skills or to do their personal work, which ranged from thesis research to industry-based applications.

The much-anticipated fieldtrip, which took place on the second day of the planktic course, was conceived to illustrate the fascinating geology of the Marche-Umbria region. In the morning, the stops included the Jurassic carbonate platforms and the Ammonitico Rosso near the Gola del Furlo, and the Contessa road section including the Bonarelli event (Oceanic Anoxic Event 2; OAE2) and the Paleocene-Eocene Thermal Maximum (PETM). After having lunch in the gorgeous city of Gubbio, the fieldtrip resumed, with the next stop on our itinerary being the Bottaccione gorge. Here, the famous K/Pg boundary described by Alvarez and colleagues prompted a spontaneous photo shoot moment. The last stop of the fieldtrip was the lovely Gorgo a Cerbara section, a proposed GSSP for the Barremian/Aptian boundary including the Selli anoxic event (OAE1a). After this exhausting yet incredibly satisfying day in temperatures soaring to 40°C (so I have been told), it was time to sit back, relax and once again experience the wonders of Italian cooking at the social dinner. Set in a refurbished farm that has been converted to a brewery, we enjoyed our meals whilst "enduring" Mike's and Rodolfo Coccioni's epic karaoke rendition of "Volare" and 'That's Amore". What a splendid way to end a wonderful day!

I'm convinced that, at the end of the ten-day course, people new to the field of foraminifera left with a firm grasp on the concepts used in foraminifera-based research, while veterans had the opportunity to refresh, expand or polish their knowledge. But perhaps more importantly, the school has acted as a catalyst in forging new professional bonds and, manifested by the many emotional goodbyes on the final day, lifelong friendships as well, which can only be beneficial for the foram community in the future. ISF…highly recommended!

Two years ago…..4th International School on Foraminifera – Urbino, Italy, 13th – 22nd July 2011

Three years ago……3rd International School on Foraminifera – Urbino, Italy, 7th - 16th April 2010

Four years ago…..2nd International School on Foraminifera

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