



# International School on Foraminifera

## 5<sup>th</sup> Course

**Urbino, 10-20 June, 2012**

### First Circular

#### Course Description

The 5<sup>th</sup> 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 foraminifera and examples of how foraminifera can be used as palaeoenvironmental 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

Two distinct courses are planned: Benthic Foraminiferal Course (11-15 June) and Planktonic Foraminiferal Course (16-20 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 CD-ROM.

#### Courses Outline

*10 June Sunday Icebreaker Party*

#### Benthic Foraminifera

*Day 1 (11 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 2 (12 June Tuesday)*

Community Structure, Life History, and Reproduction  
Oceanographic proxies, benthic foraminiferal microhabitats, and productivity/oxygenation  
Benthic foraminifera and water mass properties  
Lab: Modern smaller benthic foraminifera: Foraminiferal genera and assemblages  
The Adriatic and the Marmara Seas

*Day 3 (13 June Wednesday)*

Atlantic and Mediterranean shallow water benthic Foraminifera  
Biostratigraphy and Paleoecology of benthic foraminifera  
The ODP record, K/Pg and E/O boundaries  
Lab: A review of Jurassic to Cretaceous faunas

*Day 4 (14 June Thursday)*

Cenozoic Paleooceanographic 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

*Day 5 (15 June Friday)*

Larger benthic foraminifera  
Lab: Larger benthic foraminifera  
Aperitif

Special Lectures:

Climatic, paleoceanographic and impacts events vs. benthic foraminifera  
Upper Cretaceous DWAF in Contessa Highway Section and Romanian Eastern Carpathians

**Planktonic Foraminifera**

*Day 6 (16 June Saturday)*

Introduction to Planktonic Foraminiferal Classification  
Modern Planktonic Foraminifera  
Taxonomy of modern planktonic foraminifera  
Structure of cytoplasm, Feeding, symbionts 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 - morphometrics

*Day 7 (17 June Sunday)*

Morning field excursion  
Afternoon tourist visit  
Social Dinner

*Day 8 (18 June Monday)*

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

*Day 9 (19 June Tuesday)*

Cenozoic Planktonic Foraminifera

Biostratigraphy

Notes on Paleooceanography

Lab: Paleogene index species

*Day 10 (20 June Wednesday)*

Neogene Planktonic Foraminifera

Miocene and Pliocene Planktonic Foraminifera

Pleistocene Planktonic Foraminifera

Biochronology and Zonal schemes

Lab: Miocene index species - Pliocene-Pleistocene index species

Special Lectures:

The hyperthermal events at Contessa Highway and Road Sections

Climatic, paleoceanographic and impacts events vs. planktonic foraminifera

Quantitative Methods for Applied Microfossil Biostratigraphy

Ranking and Scaling (RASC) and Constrained Optimization (CONOP) methods (North Sea wells)

**Min number of participants: 10**

**Final deadline May 18<sup>th</sup>, 2012**

**Registration fees**

Early registration (application and payment before February 29<sup>th</sup>, 2012)

PhD/MSc Students:

1<sup>st</sup> or 2<sup>nd</sup> course     £ 290

Both courses         £ 450

Academic/Industrial staff :

1<sup>st</sup> or 2<sup>nd</sup> course     £ 380

Both courses         £ 630

Late registration (application and payment after February 29<sup>th</sup>, 2012)

PhD/MSc Students:

1<sup>st</sup> or 2<sup>nd</sup> course     £ 330

Both courses         £ 540

Academic/Industrial staff :

1<sup>st</sup> or 2<sup>nd</sup> course     £ 430

Both courses         £ 730

The fee includes:

- lectures (5-day course for benthic and 4-day course for planktonic plus field excursion)
- lecture notes
- icebreaker party
- refreshments
- aperitif
- excursion (for planktonic course)

- social dinner

## How to make an application

Registration must be done by submitting the application form to [fabrizio.frontalini@uniurb.it](mailto: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  
 Dr. Fabrizio Frontalini, Urbino University  
 Prof. Rodolfo Coccioni, Urbino University  
 Prof. Maria Rose Petrizzo, Milano University  
 Prof. Laia Alegret, University of Zaragoza  
 Dr. Andrew S. Henderson, Fugro Robertson Ltd  
 Dr. Claudia Cetean, Fugro Robertson Ltd  
 Prof. Felix M. Gradstein, Natural History Museum of Oslo

## Requirements

The course is primarily intended for young researchers at the PhD or MSc stages of their careers, working with foraminifera or meiofauna. 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 €22 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>). 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 2012 and will be sent to people who answered the first one.

We look forward to seeing you in Urbino!

**Dr. Frontalini Fabrizio**

**Two years ago.....**



**One year ago.....**

**3<sup>rd</sup> International School on Foraminifera – Urbino, Italy, 7<sup>th</sup> - 16<sup>th</sup> April 2010**  
**by**  
**Geoff Lee and Eiichi Setoyama**

April this year saw the 3<sup>rd</sup> International School on Foraminifera held at the University of Urbino, Italy. Nearly fifty students attended each week from all over Europe and the rest of the world, many from places as far away as Egypt, China, Korea, Australia, Israel, the USA, the Middle East, and a good number from South American countries. In just three years the school has become very popular and places had to be limited due to over-subscription. The school was organized and hosted by Dr. Mike Kaminski of University College London, and Dr. Fabrizio Frontalini of the University of Urbino under the auspices of, and with sponsorship from, the Gzyrbowski Foundation. There were many others involved both in the presentation and the organization of the course and some



notable names in foraminiferal micropalaeontology were included amongst the lecturers. The city of Urbino is located on a hill with panoramic views in all directions, and the old city with its palace, artworks, architecture and restaurants is only a ten-minute stroll away. Accommodation for delegates was provided at a modest cost in single en-suite rooms at the university. The rooms were clean and comfortably furnished, and breakfast was included in the price. Many of the rooms have panoramic views of the surrounding countryside including some of the highest peaks in the area. There is a cafeteria style restaurant providing lunch and dinner, although the restaurants in Urbino are well worth a visit. Staying on the site encouraged students to socialize together and lasting friendships and professional relationships have been forged that can only be of benefit to the future of micropalaeontology.

The school itself is divided into two stand-alone five-day courses, one on benthics and the other on planktonics. These can be attended individually or taken together to offer a full introduction to the subject. The courses are suitable either for first-time students or for seasoned academics and industry specialists needing to refresh or update their knowledge. Students included people at all stages in their careers from bachelors to post-docs and industrial micropalaeontologists, and from disciplines as diverse as archaeology, environmental science and geochemistry, as well as micropalaeontology. Student's interests spanned the stratigraphic record and included both fossil and recent foraminifera. The benthic course was structured to include lectures in the morning part of the session and practical work each afternoon. Input on agglutinated and calcareous forms was provided by Mike Kaminski with additional material from Claudia Ceteau of the Polish Academy of Sciences, Fabrizio Frontalini of the University of Urbino, Justin Parker of the Goethe University in Frankfurt, and Eiichi Setoyama of the Polish Academy of Sciences. Subject matter included not just the biostratigraphy, paleoecology, classification and identification of fossil taxa, but also the ecology and distribution of living forms. Extensive reference



### **The Planktonic Course at the Eocene-Oligocene GSSP**

collections were available to support study of the numerous type slides and samples available. The material included examples from the Boreal and Tethyan realms as well as the Indian, Pacific, and Atlantic oceans and the Mediterranean. Extensive use was also made of ODP samples. The planktonic course also contained a mixture of lecture and practical work and, in addition to input from Mike Kaminski, included sessions with Rodolfo Coccioni and Isabella Premoli Silva on the Cretaceous, and Maria Rose Petrizzo on the Palaeogene. Particularly popular was the use of a microscope fitted with a camera that showed the material under discussion to the whole class and which aided understanding of morphotypes and taxonomy.

Each course included a field trip and a social dinner. The benthic field trip included a visit to the Contessa quarry close to Gubbio where students were able to see and sample the Cenomanian-Turonian boundary and then walk all the way up through the section almost to the Miocene. Above the quarry on the Contessa Highway section the Cretaceous-Palaeogene boundary was exposed although, by this time, everyone was wet through due to the only day of bad weather. The boundary clay itself has long since been removed by souvenir hunters! Later a visit to the



**The Cenomanian-Turonian boundary at Contessa**

geological museum at Piobbico allowed everyone to dry off and also buy some paleontological gifts from the little shop. In the afternoon came an opportunity to explore the old town of Gubbio and then, in the evening, the social dinner included a four course meal, wine, karaoke and dancing. Mike Kaminski and Rodolfo Coccioni's rendition of some traditional songs sprinkled with some Beatles numbers will be remembered for a long time to come. The excursion for the planktonic course was to Conero national park close to Ancona. This time the

weather was kinder and a visit to the Eocene-Oligocene GSSP was enjoyed by everyone. Close by it was possible to sample the Cretaceous-Palaeogene boundary again.

At the end of the course many students took the opportunity to see a little more of Italy before they went home. Of course, for some, the eruption of the volcano on Iceland ensured that their stay as a tourist was longer than they intended but everyone agreed that the course had been interesting, worthwhile and good value.

### **Last year's report....**

#### **5<sup>th</sup> International School on Foraminifera – Urbino, Italy, 12<sup>th</sup> – 22<sup>nd</sup> July 2011**

**by**

**Benedetto Schiraldi, Rutgers University, USA and Andreea Telespan, Babes-Bolyai University, Romania**

The Fourth International School on Foraminifera took place in July at the University of Urbino, in Italy. The course has international popularity, which is evident through the enrollment of students and professionals from all over Europe, the USA, China, the Middle East, South America, as well as Africa. The success of the course is



largely a result of the organization and diligence of Fabrizio Frontalini of the University of Urbino, and Mike Kaminski of King Fahd University of Petroleum & Minerals, working under the auspices of, and with sponsorship from the Grzybowski Foundation. The success of the course can also be attributed to several other organizers, guest lecturers, and noteworthy members of the micropaleontological community. The University of Urbino was built atop a hill in the Marche region of Italy. Its location provides unmatched panoramic views of the region with easy access to the city center of Urbino where one can find fantastic food, marvelous displays of architecture, and art; especially evident

in the Duke's palace within the city center. Low cost accommodation for students was made available at the University's College de Colle with most rooms providing displays of the unmatched aesthetics of the Italian foothill landscape. A cafeteria-style dinner is available at the University for students, or in just a ten minute walk students can experience the wonders of Italian cooking within the city center. The localized on-campus accommodation fosters lifelong friendships, professional networking, and the exchange of ideas that will benefit the eclectic group of fields in which foraminifera are used. The International School is divided into two parts, one



for to the benthic community and one for the planktonic community. Both courses can be taken, or just one depending on the interest of the student. The clever design of the course caters to both amateurs as well as veterans in the field. Participants include graduate students, post-doctoral researchers, university lecturers, and working professionals. Its design makes it useful to people with interests in micropaleontology, climate science, geochemistry, geology, environmental sciences, and many

more fields, whether their interests are in modern assemblages or the deep past.

Each day of the benthic course was subdivided into two parts, the first portion reserved for lecture and the second reserved for practical applications. Lectures were aimed to illustrate taxonomic, morphological, and stratigraphic uses for foraminifera, the ecology of the foraminifera, and practical modern applications of benthics in anthropogenically impacted environments. Microscope sessions consisted of independent study with guidance from experts Drs Mike Kaminski and Fabrizio Frontalini. This section allowed each student to fine tune the necessary skills to do their own personal work, which ranged from thesis research to applied petrogeology. Additional lectures were given by Dr Claudia Cetaan (Institute of Geological Sciences, Polish Academy of Sciences, Kraków) and Prof. Laia Alegret (University of Zaragoza). The planktonic course had a very similar structure. Planktonic lectures included taxonomy, morphology, biochronological uses, applications for recent paleoclimate and water mass reconstruction, as well as lessons in reproductive, seasonal, and diurnal cycle ecology. Prestigious guest lecturers in this section included, Profs Malcolm Hart (Plymouth University) and Isabella Premoli Silva (University of Milan). The use of microscope projections as well as the added expertise of Profs Hart and Premoli Silva made the practical sections of each lecture interactive and informative. The tuition of each course included a day of field excursions and a social dinner. The benthic course field trip included the Contessa Highway and Bottaccione outcrops, with personal time in the beautiful city of Gubbio. The planktonic field trip included field excursions to the Massignano GSSP for the Eocene-Oligocene boundary, the K-T boundary at Monte Concero, as well as a several hour allotment to cool off in the Adriatic Sea. Both excursions were finished off with a fantastic Italian meal several kilometers from Urbino, some karaoke serenading by Profs. Kaminski and Coccioni, DiSTeVA, Urbino University, and finally a taste of authentic Italian pastries and limoncello.

At the end of the course, despite great reluctance, students left having strengthened their expertise of foraminifera, grown their professional network, and of course with lifelong friends.

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**[www.foraminifera.eu](http://www.foraminifera.eu)**