

## 2ND IAS INTERNATIONAL SUMMER SCHOOL OF SEDIMENTOLOGY 2007

### Carbonate sedimentation, rift tectonics and petroleum potential on continental margins

The 2nd IAS International Summer School of Sedimentology 2007 for PhD students will be held in scenic central Italy, in the Sabina and Umbria-Marche Apennines, a carefully selected location where young geologists can learn first-hand about many aspects of carbonate sedimentology and basin evolution. This region of the Apennines displays



a wealth of beautiful cross-sections of a Mesozoic, carbonate-dominated rifted to passive continental margin. Here, a regional carbonate megabank was dissected in the early Jurassic by normal faults, which became submarine escarpments bounding syn- and post-rift deeper marine basin successions. Submarine structural highs were subjected to drowning; being turned into pelagic carbonate platforms (PCPs) hosting a thin condensed carbonate cap. Three field days, including a field mapping exercise, will allow participants to take full advantage of all these features, and more. Additionally, three days of lectures will address the general concepts of carbonate sedimentation along continental margins, and the classification and evolution of carbonate platforms and adjacent basins. Through regional case studies (Atlantic, Mediterranean, Red Sea) at different time slices and the use of seismic sections, the petroleum potential of carbonate systems will be discussed with an emphasis on the reservoir properties of platform facies and resedimented basinal carbonate clastics. The general oceanographic evolution of the Jurassic-Early Tertiary Umbria-Marche basin will be addressed and the classic Bottaccione section, exposing both the Cretaceous "Ocean Anoxic Events" and the iridium-enriched K/T boundary, will be visited.



**When:** 23-30 September, 2007

**Where:** Terni and Cantiano, Central Italy

**Lecturers:** Massimo Santantonio ("La Sapienza" Univ., Roma), Dan Bosence (emeritus Royal Holloway, London), Jeroen Kenter (Chevron Energy Technology Co.), H. Weissert, J.A. McKenzie (ETH Zürich) and Alfredo Frixia (ENI E & P, Italy).

**Topics to be addressed:** Carbonate platforms and margins. Carbonates and rift tectonics: fault-block topography, platform drowning. Pelagic carbonate platform (PCP)/basin systems: PCP-top condensed sediments; submarine escarpments and their diagenesis. Differential compaction, secondary slopes, and megaclastic belts at hanging-wall basin margins. Mass wasting processes in the marine carbonate environment. Basin analysis and petroleum potential of carbonate systems: paleotectonic control, neritic platform facies, toe of platform clastic wedges, and turbidite-dominated basin successions. Tectonic evolution and general oceanographic history of the Umbria-Marche basin.

**Tools:** Carbonate sedimentology, chemo-stratigraphy, ammonite biostratigraphy and field mapping; interpretation of seismic sections and well stratigraphy; buried analogs from the Red Sea, the Atlantic, and the Mediterranean regions.

**Who should apply:** Doctoral students who are interested in aspects of carbonate sedimentology, basin analysis and hydrocarbon exploration. Applicants must be IAS student member! Up to 25 students will be accepted. Applications have to be done by the [IASnet.org website](http://IASnet.org).

**Application deadline:** 15 April 2007, acceptance announced by 30 April 2007

**Costs:** The costs are estimated to be **300 Euros/student**, double room, full pension for 7 days. Transport costs are not included, but students can apply for a travel grant when applying for summer school attendance.

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### Programme

**Lecturers: Dr. Massimo Santantonio ("La Sapienza" Univ., Roma),  
Dr. Dan Bosence (Royal Holloway, London),  
Dr. Alfredo Frixia (ENI-AGIP, Italy),  
Dr. Jereon Kenter (Chevron Energy Technology Co.),  
Drs. Helmut Weissert & Judith A. McKenzie (ETH Zürich)**

#### *Sunday 23 September*

Meet in Roma 16.00; Departure to Terni (100km); Icebreaker at Terni 18.00; 20.00 Dinner;  
21.30-22.30 - The new Summer School - Regional introduction (**M. Santantonio**)

#### *Monday 24 September*

08.30-10.00 - General concepts of carbonate sedimentology (**D. Bosence**)

(1) Carbonate grains and carbonate depositional systems

(2) The neritic carbonate factory

BREAK

10.30-12.30 - Principles of sequence stratigraphy (**J. Kenter**):

(1) Introduction and concepts

(2) Eustacy vs. tectonics: applicability of sequence stratigraphy

BREAK

14.00-15.30 - Carbonate platforms: their tectonic settings and evolution

(1) Tectonic classification of carbonate platforms (**D. Bosence**).

(2) Types of platform margins; rifting and platform drowning (Italy, Jurassic): platform breakup, drowning unconformities and syn-drowning successions; birth of pelagic carbonate platforms (PCPs) (**M. Santantonio**)

BREAK

16.00-17.30 – Carbonate platforms (contd.)

(1) PCPs: types, general facies distribution and geometries (**M. Santantonio**)

(2) Ancient PCP/basin systems in the Apennines: condensed platform-top pelagic deposits, syn- & post-rift basin fill successions; basin-margin clastic wedges; submarine escarpments (**M. Santantonio**)

**After Dinner: Student Seminars**

#### *Tuesday 25 September*

08.30-10.00 - Turning outcrops into assets (**J. Kenter**)

(1) Digital Outcrop Models: introduction and concepts

(2) Challenges and modeling techniques (static and forward modeling)

(3) Outcrop databases

BREAK

10.30-12.30 – Carbonates and petroleum system (**A. Frixia**)

(1) Reservoir, source, seal and traps. Diagenesis and petrophysics: a brief outline;

(2) Carbonate depositional environments and the petroleum system: case histories on unfractured

and fractured reservoirs; carbonate diagenesis

BREAK

14.00-15.30 – Case studies in Mediterranean realm

(1) Petroleum exploration in PCP/Basin systems in the Mediterranean region: subsurface data processing and interpretation, and petroleum potential (**Frixia**)

(2) Synsedimentary faulting vs. differential compaction: analysis of basin-margin strata (**M. Santantonio**)

BREAK

16.00-17.30 – Case studies (contd.) (**D. Bosence**)

(1) Reservoirs in rift margin carbonates; Miocene of the Red Sea and Mesozoic of Atlantic.

**After Dinner: Student Seminars**

*Wednesday-Thursday 26-27 September* – Field Trips - Sabina

**After Dinner: Student Seminars**

*Friday 28 September*

08.30 – 10.00 - Chemo-stratigraphy as a tool for basin analysis (**J.A. McKenzie**)

BREAK

10.30 – 12.00 - "Fossil fuel times": Late Jurassic and Early Cretaceous (**H. Weissert**)

(1) Climate and oceanography

(2) Carbon cycle and black shales

Departure to Cantiano (130km) – Bottaccione along the way

*Saturday 29 September* – Field Trip – Marche

*Sunday 30 September* - Return to Roma (230km), arrival 14.00