

4<sup>th</sup> INTERNATIONAL  
LIMNOGEOLOGY CONGRESS



# Limnogeology: tales of an evolving Earth

Programme and abstracts book



**COSMOCAIXA**  
BARCELONA

July 11-14th 2007

**The International Association of Limnogeology (IAL)** is pleased to welcome you to the **4th International Limnogeology Congress (ILIC 2007)**, which will be held in the CosmoCaixa venue. We must thank the academic, research and social institutions that have made possible this congress, and also thank you researchers and professionals who will be involved in the congress development.

Limnogeology aims at the multidisciplinary study of ancient and recent lacustrine systems and their paleoenvironmental and environmental significance. As a consequence, the congress sessions will deal with both integrative and specialized contributions from very diverse fields of research focused on any kind of lacustrine records. This may be a great opportunity to open our minds to new research lines on lacustrine records and enrich our own future research.

Since 1995 the **ILICs** have been the main **IAL** activity and have been promoting collaboration among researchers across all disciplines of lacustrine research, from related Earth Science disciplines (i.e. Sedimentology, Stratigraphy, Basin Analysis and Modelling, Structural Geology, Geochemistry, Paleogeography and Paleoclimatology, among others) to Paleolimnology and Lacustrine Paleobiology. The previous congresses were held in Denmark (1995), France (1998) and United States (2003). Therefore, this 2007 edition is the continuation of a congress series dealing with the holistic study of ancient and recent lacustrine basin systems and ecosystems, and providing a periodic updated overview of the state of knowledge on lacustrine records and of advances in their comprehension.

The planned activities of the 4th International Limnogeology Congress comprise guest plenary lectures by some researchers and oral and poster contributions from other attendees. In this new ILIC edition, topic oral and poster sessions will be the main activity, including thematic sessions that in some cases will be new for our congresses. Furthermore, pre and post-congress field trips showing the results of the study of ancient and recent lacustrine records in the NE of Spain have been organized.

We have great pleasure in welcoming you to Barcelona for this Congress and we trust that you will enjoy it. Barcelona and its much diversified reality are waiting for you. Barcelona is open to all of you, just at the edge of the Mediterranean, a small nearly closed sea that some times became a lake. The so-called "*Mare Nostrum*" ("Our Sea") by the ancient Romans and that we would like to share with all of you.



Prof. Dr. Lluís Cabrera  
Chair of the 4th ILIC Congress



**ORGANIZING COMMITTEE****CHAIR**

Lluís Cabrera, SPAIN

**CO-CHAIR**

Ana Alonso-Zarza, SPAIN

M<sup>a</sup> Concepción Arenas, SPAIN

José P. Calvo, SPAIN

Xavier Delclòs, SPAIN

Miguel Garcés, SPAIN

Santiago Giralt, SPAIN

Carles Martín-Closes, SPAIN

Ana Moreno, SPAIN

Alberto Sáez, SPAIN

Blas L. Valero-Garcés, SPAIN

**STEERING COMMITTEE**

Pere Anadón, SPAIN

H. Paul Buchheim, USA

Alan R. Carroll, USA

Andrew S. Cohen, USA

Isabelle Cojan, FRANCE

Reinhard Gaupp, GERMANY

Elizabeth H. Gierlowski-Kordesch, USA

Thomas C. Johnson, USA

John W. Magee, AUSTRALIA

Nanna Noe Nygaard, DENMARK

Robin W. Renaut, CANADA

Michael R. Talbot, NORWAY

Jean-Jacques Tiercelin, FRANCE

**SCIENTIFIC COMMITTEE**

Flavio Anselmetti, SWITZERLAND

Daniel Ariztegui, SWITZERLAND

Ildefonso Armenteros, SPAIN

Kevin Bohacs, USA

Miquel Canals, SPAIN

Jordi Catalan, SPAIN

Gian Paolo Cavinato, ITALY

Guillermo Chong, CHILE

Marc De Batist, BELGIUM

Trinidad De Torres, SPAIN

Marian Fregenal, SPAIN

Ángel García Cortés, SPAIN

M<sup>a</sup> Angeles García del Cura, SPAIN

Cahit Helvacı, TURKEY

William Last, USA

Nieves Meléndez, SPAIN

Federico Ortí, SPAIN

Gonzalo Pardo, SPAIN

Antonio Pérez, SPAIN

Eduardo Piovano, ARGENTINA

Juan José Pueyo, SPAIN

Michael Rosen, USA

Bruno Turcq, BRAZIL

Paul Wright, UNITED KINGDOM

H.C. Zhang, CHINA

Bernd Zolitscka, GERMANY

Research, Telegrafenberg A 43, D-14473 Potsdam, Germany. <sup>2</sup>Institute of Geochemistry and Geophysics, National Academy of Sciences of Belarus, 7 Kuprevich street, 220141 Minsk, Republic of Belarus.  
Email: Katarzyna.Stachura-Suchoples@awi.de

Diatoms are microscopic organisms that siliceous frustules well preserved in the sediment. The number of diatom species is estimated for minimum 40,000. Due to sensitive response to short-term and long-term environmental changes of particular species and diatom assemblages they are used in marine, coastal and lacustrine basins as bioindicators to trace (palaeo)ecological, (palaeo)environmental and (palaeo)climatic changes.

The relict, freshwater diatom genus **Pliocaenicus** Round & Håkansson currently contains seven species, mainly Pliocene, restricted to the Northern Hemisphere. The recent populations are represented by one species (**Pliocaenicus costatus**) and have been traced only in the Asian Arctic and the Baikal Rift Zone Lakes.

Originally, the genus **Pliocaenicus** was differentiated by four characters. In order to clarify the generic position we analyzed ultramorphological characters of all known species. It allowed to amend the genus description by six more ultramorphological features and clearly separate **Pliocaenicus** from closest related genera: **Cyclostephanos** Round and **Tertiarius** Håkansson & Khursevich. The comparative analysis within taxa provided a taxonomic key for species determination. The biogeographic distribution reflected rich biodiversity of the genus **Pliocaenicus** during the Pliocene in Eurasia (occurrence of all known species), and the Holocene expansion of **P. costatus sensu lato** in the Asian Arctic and the Baikal Rift Zone Lakes.

Observations on geographical isolated populations of **Pliocaenicus costatus** from new localities in the Northern Yakutia, Russia (the Holocene) and the Verkhoyansk Mountains, Russia (Recent), re-investigations of existing material from Transbaikalia area, Russia (the Pliocene), Zhidini profile, Latvia (the Pleistocene), Alaska, USA (the Pleistocene), Chukotka, Russia (Recent), the Baikal Rift Zone Lakes, Russia (Recent), observations extended from literature sources e.g. Kamchatka, Russia (the late Miocene), the Polar Ural, Russia (Recent), the Baikal Rift Zone Lakes, Russia (Recent) defined criteria for varieties and/or species level within **Pliocaenicus costatus**. Analysis of the Holocene sediment from the Northern Yakutia revealed good correlations of quantitative climate reconstruction based on pollen analysis and changes in the relative abundance of **Pliocaenicus cf costatus**.

These studies enhance the genus position, and provide a taxonomic key for species determination that also reflects a relationship among particular species of **Pliocaenicus**. It also contributes to the knowledge about diatom biogeography. Studies on **Pliocaenicus costatus** gave unique possibilities to observe this relict genus in recent natural environmental conditions. These observations also have important implications for an interpretation of palaeogeographical development within Eurasia and the Holocene development within the Asian Arctic.

## S16-03

### Fossil association from Vega de Pas site (Lower Cretaceous, Basque-Cantabrian Basin, Spain)

Jose Joaquin Moratalla, Graciela Delvene, David Didier Bermúdez-Rochas, Montserrat De la Fuente, Javier Hernán  
Museo Geominero, Instituto Geológico y Minero de España, Madrid, Spain.  
Email: j.moratalla@igme.es; g.delvene@igme.es; d.bermudez@igme.es; m.delafuente@igme.es;

This report deals with preliminary data whose aim is to understand a continental Lower Cretaceous environment located at the north of Spain, following a multidisciplinary study.

The Basque-Cantabrian Basin is located in the northern part of Iberian Peninsula. The evolution of this basin during latest Jurassic-Lower Cretaceous was related to the North Atlantic Ocean and Bay of Biscay opening, with a sedimentary infill controlled by strong syndimentary tectonics. The fossil outcrops are placed in the Vega de Pas township, in Cantabria province. The sedimentological and stratigraphical criteria allow us to assign this site to the Capas de Viviparus Member from Vega de Pas Formation (Hauterivian-Barremian) deposited in a freshwater lacustrine environment.

Molluscs are the predominant group of the fossil association, and include gastropods and bivalves. Representatives of Viviparidae and Thiaridae gastropod families, both belonging to freshwater environments, are common in VP-1 section. Bivalves in that section are less abundant than gastropods, but their diversity is higher. **Margaritifera valdensis** and some species of **Unio** have been identified. Both belong to Unionoida order and they are suspension-feeders typical in freshwater ecosystems. Pisidiidae family is represented in our section by a few specimens. These bivalves, whose feeding mechanism varies between suspension-feeder and deposit-feeder, are characteristic from freshwater environments.

Regarding to the ichthyological remains, actinopterygian and condrichthyan elements have been recovered from VP-1 section. The actinopterygian fishes are represented by isolated remains of semionotiforms, pycnodontiforms and amiiforms, including teeth, scales and bones. There are also articulated dentitions corresponding to prearticulars and vomers of pycnodontiforms. Condrichthyan remains consist of one fin-spine, two cephalic spines and several teeth from the euselachian Hybodontidae superfamily. Concerning to the teeth, they belong to Hybodontidae, Lonchidiidae and Acrodontidae families.

Dinosaurs are represented in the Vega de Pas area only by tracks from 4 localities (VP-1 to VP-4). Some of them are relatively well preserved casts while others are in situ located molds. Only VP-3 has yielded a complete dinosaur trackway constituted by 4 prints. The general morphology of the Vega de Pas dinosaur footprints, their digital shape, and their heel outline suggest that they were produced by theropod dinosaurs. Ornithopod footprints have been found only in VP-2 locality as an isolated track. The presence of these tracks suggests that these lacustrine environments were clearly dominated by theropod dinosaurs.

## S16-04

**Paleoenvironmental reconstruction of Pleistocene fluvio-lacustrine landscapes in Armenia by multiproxy studies: geomorphology, K/Ar chronology, paleomagnetism, leaf flora and pollen analysis.**

Paul Roiron<sup>1</sup>, Ivan Gabryelyan<sup>2</sup>, Sébastien Joannin<sup>3</sup>, Samvel Nahapetyan<sup>4</sup>, Vincent Ollivier<sup>5</sup>, Jean-Jacques Cornée<sup>6</sup>

<sup>1</sup>Centre de BioArchéologie et Ecologie, UMR 5059, Université de Montpellier 2, Montpellier, France.

<sup>2</sup>Botanical Institute, Yerevan University, Armenia.

<sup>3</sup>Paléoenvironnements et Paléobiosphère, UMR 5125, Lyon 1, France. <sup>4</sup>Department of Geomorphology and Cartography, Yerevan University, Armenia. <sup>5</sup>Economies, Sociétés et Environnement préhistorique, UMR 6636, Aix-en-Provence, France. <sup>6</sup>Paléoenvironnements et Paléobiosphère, UMR 5125, Lyon 1, France

Email: paul.roiron@univ-montp2.fr

Because of its peculiar geographical position between the Mediterranean basin and Asia, the Caucasus range played an essential role in the safeguarding of thermophilous plant relics during the Plio-Pleistocene. This region is also particularly rich in archaeological sites attesting to the antiquity of human occupation in the area. However, on the con-

trary to the Mediterranean basin, the Small Caucasus is still very poorly studied from geological, geochronological, paleoenvironmental as well as archaeological points of view.

In southern Armenia, field prospections of a French ECLIPSE program team and isotopic analyses show that volcanism was active during the Pleistocene and until the Postglacial period. The pleistocene fluvio-lacustrine formations containing abundant leaf impressions and pollen grains provide detailed information on the evolution of the vegetation. The chronology is provided by K/Ar and Ar/Ar data on basalt and volcanic pumice samples and by paleomagnetic measurements at high chronological resolution.

The main aim of our study is to evaluate the respective influence of the climate and other natural perturbations (volcanism, glaciations) on the paleo-environmental dynamics.

The macroremains analysis of Shamb section (older than 1 million years) testifies to a high diversity in the riparian and aquatic plants (*Alnus*, *Populus* ssp., *Salix* ssp., *Phragmites*, *Myriophyllum*, *Potamogeton*, *Ceratophyllum*, ..) as well as in deciduous oak forest species (*Quercus cerris*, *Q. iberica*, *Q. macranthera* associated with *Acer*, *Betula*, *Tilia*, *Ulmus*, *Prunus*, *Pyrus*, *Malus*, *Sorbus*....). Steppic and xeric taxa are also well represented (*Juniperus*, *Berberis*, *Lonicera*, *Ribes*, *Rosa*, *Spiraea*, *Acer ibericum*, *Celtis caucasica*, *Cotinus coggygia*, *Amelanchier ovalis*, *Spiraea hypericifolia*, *Fraxinus oxycarpa*...).

The combined palynological and macroremains analysis of the same section highlights the alternation of relatively forested and steppic phases related to climatic variations. During the Quaternary, this area underwent major climatic fluctuations, going from a warm-temperate climate to a drier and temperate climate, and then to a cold climate during the glacial periods.

The result of the Ar/Ar dating in progress on nearby sites (Vaghatin, Uyts, Tolors) will enable us to correlate chronologically other lacustrine sequences containing leaf floras.

## S16-05

**The Palynology and Palaeoecology of the Eastern European Palaeogene from Deposits of the Boltysch Post-Impact Crater, Ukraine**

Robert Daly

Geology and Petroleum Geology, University of Aberdeen, Aberdeen, United Kingdom.

Email: robertdaly@abdn.ac.uk

## SPONSORS



## ORGANIZERS

