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INTERNATIONAL ASSOCIATION OF SEDIMENTOLOGISTS



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REPORT

3rd IAS International Summer School of Sedimentology 2009

«Sedimentary Archives of Regional vs. Global Change: Case Study of Neogene Basins of Southern Spain»

Following the success of the 2 previous IAS International Summer Schools of Sedimentology held in 2005 and 2007, a third one was conducted from 4 to 11 October 2009 in Carboneras (Almeria), southern Spain. Applications to attend were solicited from IAS student members and a diverse group of 27 post-graduate students from all over the world were selected to participate. They came mainly from European countries including Belgium (1), France (2), Italy (7), Norway (1), Romania (1), Spain (2), Switzerland (1), The Netherlands (2) and U.K. (1), but many students traveled greater distances with three coming from Argentina and one each from Brazil, Saudi Arabia, South Korea, Turkey, U.S.A. and Venezuela. Six lecturers, who participated in all activities throughout the week, rounded out the enthusiastic group. They included Juan Carlos Braga and

Jose M. Martin (Universidad de Granada, Spain), who are experts in the regional sedimentology. They also served as our local hosts making accommodation and travel arrangements for the group. Additionally, Peter Haughton (University College Dublin, Ireland) and Frits Hilgen (University of Utrecht, The Netherlands), who both have extensive field experience in southern Spain, were major contributors to the Summer School. Judith A. McKenzie and Helmut Weissert (ETH Zürich, Switzerland), who have been instrumental in establishing and running the IAS Summer Schools, completed the team of lecturers.

On Sunday afternoon, 4 October, the Summer School participants converged on the Malaga airport and traveled together by coach to Carboneras. After arrival, students were introduced into the regional geology



Figure 1. Group photograph of Summer School participants, excluding J.C. Braga, the photographer, gathered on the beach-front steps of the Hotel El Dorado.

of the Neogene basins in southern Spain with the focus on the geological history of the Sorbas and Tabernas Basins. These basins serve as natural laboratories for carbonate and evaporite sedimentology, as well as for the study of sedimentary gravity flow deposits.

figuras 2 y 3

A day of lectures occupied the students on Monday. Juan Braga and Jose Martin presented modern concepts of carbonate sedimentology and Judith McKenzie focused in her lectures on evaporites and dolomite formation and associated microbialites. A field trip to the Sorbas Basin guided by Juan Braga and Jose Martin followed on Tuesday. The students were confronted with a beautiful example of basin evolution and evaporite formation during the time of the

Messinian salinity crisis.

Wednesday was devoted to cyclostratigraphy, astrochronology and its application in Neogene stratigraphy. Frits Hilgen split the day into a morning lecture followed by a return field trip to the Sorbas Basin, where students learned first hand, with the help of shovels, to identify sediment cycles in hemipelagic sediments of Miocene age. With this new awareness of how cycles are counted, the students returned to Carboneras to gain further experience with a computer practical exercise.

On Thursday morning, a third field trip brought students to excellent outcrops of Miocene temperate water carbonates near Carboneras. The students returned to Carboneras for the afternoon lecture on carbonates, the carbon cycle and



Figure 2. Juan Carlos Braga pondering the puzzling pink-colored Miocene carbonates with students in the Sorbas Basin.



Figure 3. José Noel Pérez Asensio (University of Granada), assistant for IAS Summer School, explaining sedimentary features in Tabernas Basin to Alberto Trecalli (University of Naples).

climate. Helmut Weissert demonstrated how carbonate systems and the carbon cycle were coupled in Cenozoic and Mesozoic Earth and climate history.

While the Sorbas Basin serves as an excellent study area for evaporite and carbonate sedimentology, the neighboring Tabernas Basin contains a thick succession of Tortonian turbidites with intercalated sedimentary gravity flow deposits. The small size of this basin and excellent exposures make it possible to follow individual deposits through the basin. Peter Haughton gave his introductory lectures on sedimentary gravity flow deposits and deep-water turbidites on Friday and then guided the Summer School participants through the Tabernas Basin on Saturday. Figure 4

All students participating in the IAS Summer Schools are required to make a 15-minute presentation on their own doctoral research to their attentive colleagues. Although these presentations consume a considerable amount of free time, particularly in the evenings, they have proven to be very popular. For many students, it is the first time they have had the opportunity to make an oral presentation before a scientific audience. In Carboneras, the student presentations stimulated discussions among all the participants, new contacts were established and nurturing criticism help everybody with the further development of his or her research.

Carboneras was a perfect spot for the IAS Summer School 2009, the Spanish colleagues were fantastic



Figure 4. Rebecca Martin-Garcia (Complutense University of Madrid) pointing out interesting outcrop to Julie Dewit (KU Leuven) on the left and Juan Carlos Laya Pereira (University of the Andes) in the center.

hosts, both students and lecturers enjoyed regional geology and the excellent summer weather in October, with the Mediterranean waters still warm enough for an afternoon swim. The accommodations in the charming Hotel El Dorado provided a relaxing atmosphere to enjoy the traditionally late Spanish dinners and excellent wine from the Almeria region. The student evaluations of the IAS Summer School 2009 were extremely positive and encouraging for future student oriented programs. One student proposal for dedicated IAS student member field trips at IAS meetings will be realized at the upcoming 18th ISC in Mendoza.

Based on the overwhelming success and positive feedback

received from the students who have participated in the first 3 IAS Summer Schools, the IAS Bureau has proposed that they be continued on a biennial cycle. We have now formalized a statement of rationale for the IAS International Summer School of Sedimentology, which can be found posted on the IAS web site (www.iasnet.org/meetings/summerschool.php). Although not officially scheduled, Rudy Swennen (Katholieke Universiteit Leuven, Belgium) will lead the next IAS Summer School 2011 to be held in Albania. Further information will be forthcoming later this year in the IAS Newsletter.

Helmut Weissert and Judith McKenzie

Report

Workshop meeting Geological and bio(geo)chemical processes at cold seeps

*Challenges in recent and ancient systems
Varna, Bulgaria, September 28-30, 2009*

Phenomena related to hydrocarbon migration and expulsion have been recognized and studied worldwide in both modern active settings and at fossil seep sites and in various sedimentological and geodynamic settings. These locations have a unique potential to study the interaction between the geosphere and (micro)biosphere and to investigate the fingerprinting and preservation of biogeological processes in the geological record. Moreover, they provide a window into (ancient) fluid flow of hydrocarbon-bearing fluids in different geological contexts. Research of modern cold seeps reveals valuable information on near-seabed processes (often studied with highly advanced analytical techniques), fluid sources and on deep-seated fluid pathways. On the contrary, ancient seeps are logistically easy accessible spots, allowing a detailed study of the

(shallow) subsurface seep plumbing system and of the heterogeneity of complex seep processes in 4D (space and time).

The goal of this workshop was to bring together sedimentologists, geochemists, microbiologists, biologists, geophysicists and scientists from related disciplines, to:

- (1) highlight new emerging concepts and approaches, and
- (2) define key questions in the study of cold seep systems and their environment through geological time.

The meeting was organized in different discussion sessions, whereby each session was introduced by 2 or 3 *key presentations*, followed by a number of *short communications*.

The workshop meeting started with a field trip to the Eocene seep system exposed at the Pobiti Kamani area, about 20 km west of Varna (Bulgaria). The ancient methane

seep system illustrates in a striking way the expression of a fault-associated fluid migration system. An important point of discussion was the possible identification of such structures on seismic data at modern seep sites. The way how the different seep carbonate structures were formed in the ancient seep environment (near the seabed and/or in the sediment column), the possible significance of their occurrence in vicinity to faults and their relevance with respect to past seepage dynamics and flow patterns were other interesting points of discussion.

Session 1: Fluid flow from source to surface (chairs: J-P. Henriot & I. Klaucke).

Keynotes of the session addressed various modes of fluid flow from the source to the surface, illustrated by seismic/acoustic imaging and modelling. Short communications reviewed a variety of settings, from the Gulf of Cadiz to the Black Sea,

New Zealand and Lake Baikal. Future perspectives dealing with the topic of the session can be summarised as follows:

- ♦ There is a need to make the linkage between seismic responses (and the causes, which might explain these responses) to field studies. It is obvious that a scale-problem exists, since many of the seismic features are at sub-kilometre scale while field observations are performed at the scale of several hundreds of metres.
- ♦ Numerical modelling certainly will become in the future an additional tool to better understand the behaviour between focused and diffuse fluid flow and potentially will help in seismic modelling and bridge the gap between seismic features and outcrop.
- ♦ In addition, the physical constraints of subsurface fluid circulation (i.e. pressure and permeability constraints,



Figure 1. Group picture of part of the Workshop Party at the Beloslav quarry. Ten metre tall tubular sandstone concretions can be seen at the left side of the picture. (photograph by C. Petrea).

etc.) and their variation with time need to be studied both at the scale of continental margins and at the scale of individual outcrops.

Session 2: Fluid sources in seep systems (chairs: G. Dickens & R. Swennen)

Different sources relating to cold seep carbonates were addressed, but the discussions clearly showed the risk to rely on only one parameter in deducing a potential source. It is by combining different constraints that a likely source can be deduced. Techniques like isotope analysis of gases enclosed in fluid inclusions in methane-related carbonate cements may become a strong technique in understanding the processes involved. It may also be helpful if additional geochemical tracers (like REE) would be used to further characterize seep sites. Some future research directions that deserve attention can be formulated in terms of a few key questions:

- ◆ Where do the fluids, including gases and dissolved species, at various seeps come from?
- ◆ Why do various fluid migrations and seeps have a

wide manifestation of seafloor signatures?

- ◆ How are fluid compositions at seeps recorded/preserved into the geological record?

Session 3: Geomicrobiology and biomineralization (chairs: D. Birgel & N. Pimenov)

The session dealt with the inventory of microbes present at modern methane seeps (consortium of sulphate-reducing bacteria and methane-oxidizing archaea; AOM). In general, the close relationship of mineral formation and the activity of the AOM consortium was already shown in some studies published in the last years. Both at ancient and modern seep sites, specific carbonate phases have been identified as closely related to AOM. Only by combining various methods (petrography, stable isotopes, lipid biomarkers, palaeontology, elemental analyses), it might be possible to characterize and reconstruct some ancient seep locations by comparing them with observations made at modern sites.

The presence and stability of lipid biomarkers was another point of



Figure 2. Overview of part of the Beloslav quarry from distance. The wall is approximately 35 m high. (photograph by A. Foubert).

concern. In the AOM products (authigenic carbonates), lipid biomarkers can be excellently preserved over a long time period (oldest finding: Late Carboniferous). However, not at all seep sites, authigenic carbonates are described. The problem for many sediments where AOM took place is, that often the AOM biomarkers are easily degraded. A similar problem may appear as well in ancient mud volcanoes where an admixture of different organic matter sources is most likely. Future perspectives on the topic can be summarised as follows:

- ♦ Further studies of microbe-mineral interactions, mineral phase-specific lipid biomarker contents throughout the paragenetic evolution of seep carbonates e.g., by means of TOF-SIMS, Nano-SIMS, RAMAN spectroscopy, can help to better understand the interplay of biology and mineralogy and constrain the seepage conditions.
- ♦ Laboratory experiments with various AOM consortia may definitely help to increase our knowledge about how exactly mineral formation takes place and which of the consortia produce what kind of precipitates. However, it is difficult to characterize ancient seep sites because conditions (methane flux, temperatures, sedimentation rates etc.) can change rather quickly. For this reason, at many locations only an «averaged» signature is preserved in seep precipitates.

Session 4: Authigenic seep products (chairs: D. Fontana & A. Foubert).

The session focused on ancient and modern seep-carbonates, from different geological settings, age and localities (Apennines, New Zealand, Bulgaria, Romania, Niger delta, France, etc.). Many of these deposits show a number of *common features*, such as the shape of authigenic bodies, mineralogy, internal organization, isotopic signatures and the paragenetic sequence of carbonate phases. Future research perspectives with respect to authigenic seep products can be summarized by a number of questions:

- ♦ Cold-seep carbonates through time: Globally, cold seep carbonates occur throughout the Phanerozoic record. However, in New Zealand and Italy they are mainly of Miocene age. Is there any evidence for the preferential development of cold seep carbonates at certain times during the Phanerozoic, and if so, why?
- ♦ Could the pumping activity of chemosynthetic benthic macrofauna influence the chemical composition of seep carbonates?
- ♦ The discussions stressed the importance of field sedimentological studies, mainly facies analysis, to better understand the depositional environment of seep sites. Especially, the influence of sea-level variations controlling seepage activity has not yet been well-documented in

ancient systems?

- ♦ How might the changing ocean geochemistry through time have influenced the nature, mineralogy and geochemistry of seep products?

Final comments on the workshop (by Rudy Swennen)

An important point to stress is the necessity to compare ancient systems on land and modern offshore



Figure 3. Workshop participants amazed about a ~ 5.5 m high column at the Slanchevo S area that is built up entirely of centimetre- to decimetre-sized spheroidal sandstone concretions. (photograph by T. Himmler).



Figure 4. Overview of the Central group, a site with about 600 metre-sized tubular sandstone concretions that reflect a shallow seep plumbing system. (photograph by E. De Boever).

systems. The comparison is at present still problematic because different methodologies are applied, the work is carried out at different scales and diagenetic overprints hamper geochemical interpretations at ancient seep sites, However, if we want to arrive at an integrated understanding of the development and evolution of seepage systems, discussions between scientists working in modern and ancient systems are a prerequisite. A concerted action to study systems where they occur together in the same geodynamic setting (e.g. New Zealand) certainly will help to define and unravel several key questions in cold seep (carbonate) research.

A wide variety of seep carbonate products exists in terms of size, morphology and fabric. There exists

a need for summing up the wide variety of seep related structures (e.g. mud volcano characteristics) and associated features (e.g. concretionary carbonates) and to define a set of end-members, of which the processes involved can be constrained. In addition, aspects to be addressed are for example the depth at which columnar structures develop as well as the time duration of concretionary growth.

At last, an effort should be made to study cold seep carbonates in lake settings since in lacustrine environments other extremes in carbonate development can be studied.

*Compiled by Eva de Boever
K.U. Leuven, Belgium*

Obituary

Michael Richard Ronald Talbot (1943-2009)

Mike was born in Haywarden, Clwd, G.B. November 17, 1943. He died November 6, 2009 in Bergen, Norway.

Mike received his Ph.D in geology from the University of Bristol in 1968. His thesis was entitled «The Deposition and Diagenesis of the Corallian Beds of Suthern England». He then worked on the coral reefs and associated sediments of the Seychelles as a NERC-funded Post-Doctoral Research Assistant, University of Dundee, U.K. From 1972 to 1978 he was employed as a Lecturer in Geology, University of Ghana, Legon, Ghana/Department of Earth Sciences. This post, created by the University of Leeds, and supported in Ghana by the British Ministry of Overseas Development, involved 3^{1/2} years teaching at the University of Ghana (1973-76). He subsequently worked as a Lecturer at the Department of Earth Sciences, University of Leeds from 1978-81 before accepting a post as Senior Lecturer at the Geological Institute in Bergen, Norway. In 1984 he was

appointed Professor at the same institute (now Department of Earth Science).

Mike had a varied research interest that was focused on limnogeology, modern and ancient rift sedimentation, as well as carbonate sedimentology and diagenesis. His recent research effort was concentrated on the large lakes of East Africa, with field work and coring on Lakes Victoria, Edward, George, Malawi, Bogoria and Baringo. This work was a contribution to the International Decade for the EastAfricanLakes (IDEAL) project. He was also involved in the multidisciplinary NORPEC (Norwegian Palaeoenvironments and Climates as Reconstructed from Lake Sediments) project.

Mike started his professional career as a carbonate sedimentologist, and during the last 10 years much of his research was again focused on these fascinating deposits. This research included

sedimentological and diagenetic studies of collapse breccias associated with the Late Palaeozoic carbonates and evaporites in central Spitsbergen, reservoir characterization of Lower Cretaceous karstic platform deposits and Upper Cretaceous slope deposits in Gargano (Italy), sequence-stratigraphic studies of mixed carbonate-siliciclastic deposits of Miocene age in Spain, and sedimentological studies of Miocene temperate-water carbonates, also in Spain.

Mike was a Bureau Member, International Association of Sedimentologists 1990-1998, Editor-in-Chief, *Sedimentology*, 1990-1994, co-founder and executive Committee Member, IDEAL Project, co-ordinator, EURO-IDEAL, a EU-funded network of European scientists associated with the IDEAL project, and European representative on Lake Drilling Panel, Science Advisory Group of the International Association of Limnogeology (2002-2007), Associate Editor, *Journal of palaeolimnology* (2003-2009), and member of the Editorial board of *palaeogeography*, *Palaeoclimatology*, *Palaeoecology* (2003-2009). Since 2003 and to his death he was the scientific project manager of the Carbonate Research Group (www.carbonateresearchgroup).

Mike was a devoted teacher and supervisor. He had extensive teaching experience at all levels from introductory undergraduate to postgraduate. He also held specialist



graduate-level courses for industry and other institutions. He was an adviser to 60 M.Sc. and 14 Ph.D. students.

Mike was an author of over 100 papers in refereed journals, books and special publications. In 2007 he received the W.H. Bradley medal for «his stellar research career as well as his dedicated services to the Limnogeology community».

Mike will be remembered as an outstanding scientist, teacher and supervisor with a friendly, generous, and diplomatic character. He will be sorely missed.

*Gunnar Saelen
Department of Earth Science
University of Bergen, Norway*

Report

12th French Meeting of Sedimentology

Rennes, 27-29 October 2009

The 12th meeting of the French Sedimentologists Association (ASF; <http://www.asf2009.univ-rennes1.fr/>) took place last October in Rennes (Brittany, France).

The meeting was dedicated to Bruno Savoye, a world-renowned specialist in marine gravity processes, who unexpectedly passed away last summer. Bruno had a very strong commitment to the French scientific community, including sedimentologists and the ASF.

Before and after the meeting, there were 4 excursions (involving 15 to 25 persons) along the coast of Brittany. They took advantage of the scenic outcrops around Mont St Michel Bay, the Crozon Peninsula and the Morbihan. Another excursion was to downtown Rennes, for an introduction to the regional geology, as visible in building materials.

The three-day meeting was hosted by the University of Rennes 1 on its main campus. Financial support came from 20 sponsors. The 370 participants presented about 240 talks

and 90 posters. The 21 sessions included one for each depositional environment (including exosedimentology), thematic sessions illustrating the research themes of the Geosciences group at Rennes (interaction between deformation and sedimentation, source to sink studies on passive margins, geomorphology, industrial applications of sedimentology, etc.), as well as a session on education and its dissemination in the Earth Sciences. More than 16 keynote speakers, national and international renowned scientists, highlighted the sessions.

The Plenary Session included a keynote talk by C. Truffert (BRGM) and a series of presentations illustrating the career of Peter Homewood, who recently retired. Peter was a pioneer in the description of tidal fan facies and in the understanding of interactions between deformation and sedimentation. He has contributed to the careers of many young French researchers and engineers, improving their scientific and technical skills. The «Yvonne

Gubler» Prize for the best Ph.D. thesis (sponsored by Suez - Gaz de France) went to S. Rohais, for his work on the stratigraphic architecture and sedimentary supply of the Gulf of Corinth (Grece).

The 13th meeting of the French Sedimentologist Association will be

hosted in 2011 by the University of Bourgogne in Dijon and will be organized by the Biogeosciences group.

*Delphine Rouby
Université de Rennes 1
France*

Announcement

Annual meeting of GeoSed (Italian Association for Sedimentary Geology)

Torino, Italy, 19-25 September 2010

A multidisciplinary research group composed of personnel of the Dipartimento di Scienze della Terra of the Torino University and of the Istituto Geoscienze e Georisorse of the Italian CNR (National Research Council) is organizing the annual meeting of GeoSed (Italian Association for Sedimentary Geology) that will be held in Torino in September (22-23/09/2010). It will be preceded by a 3-day field trip in Maritime Alps, and followed by a 2-day field trip in the Tertiary Piedmont Basin. Inscription to the meeting is not mandatory in order to participate in the field trips.

During the meeting, oral and poster presentations on any aspect of sedimentary geology are welcome, including both basic research (basin analysis, sedimentary petrology, diagenesis etc.) and applications (e.g. geochronology, hydrostratigraphy).

The **pre-meeting field trip** (19-21/09/2010) will be held in the

Maritime Alps and focussed on stratigraphical and structural aspects of the Eocene alpine foreland basin succession. It unconformably overlies Mesozoic sediments of the North Tethyan passive margin and includes continental to marginal marine facies of incised valley fill, mixed and carbonate sediments of middle to outer ramp with foramol facies dominated by *Nummulites* and coralline algae respectively, slope marls and siliciclastic turbidites. At the top of the latters, a sedimentary mélange related to mass wasting processes involving both extrabasinal and intrabasinal sediments occur. Localized cementation and veining document the important role of fluids flowing upward in the sedimentary column along fault planes.

The **post-meeting field trip** (24-25/09/2010) will be focussed on the Late Miocene tectono-sedimentary evolution of the Tertiary Piedmont Basin. In particular, slump scars



Figure 1. Block-in-matrix fabric of debris flow deposits within the Ventimiglia Flysch.

beautifully exposed within Tortonian slope marls document tectonically driven gravitational instabilities. In the overlying lower Messinian sediments, methane-rich fluid seeping is recorded by different types of carbonate-rich rocks originated both within the sedimentary column and at the sea floor (*Lucina*-bearing

limestones) that also bear evidence of the formation and dissociation of gas hydrates. These rocks also occur as scattered blocks in overlying upper Messinian chaotic deposits suggesting a possible link between sediment instabilities and the upward flow of methane-rich fluids. In other portions of the basin, the bio-



Figure 2. Discordances of bed dips and truncations of beds (black arrows) evidence multiple slump scars (blue lines) within Tortonian slope marls.

sedimentary events heralding the Messinian salinity crisis (MSC) together with unusual evaporitic and post-evaporitic facies are exposed

allowing to discuss the sedimentary response to the main MSC events at the northern end of the Mediterranean basin.



Figure 3. Vertical fluid conduit cemented by CH₄-derived dolomite occurring within lower Messinian marls.

IAS Postgraduate Grant Scheme

IAS has established a grant scheme designed to help PhD students with their studies. We are offering to support postgraduates in their fieldwork, data acquisition and analysis, visits to other institutes to use specialised facilities, or participation in field excursions directly related to the PhD research subject.

Up to 10 grants, each of about € 1000 are awarded twice a year.

These grants are available for IAS members only, and only for PhD students. Students enrolled in MSc programs are **NOT** eligible for grants. Research grants are **NOT** given for travel to attend a scientific conference, **NOR** for acquisition of equipment. Student travel grants for conferences can be usually obtained directly from organizers of the meeting.

The **Grant Scheme Guidelines** provide a summary of required information needed for successful a Grant Application. Applications are evaluated on the basis of the scientific merits of the problems, the capability of the researcher, and reasonableness of the budget.

Supervisor's Letter Guidelines list the information needed.

IAS Grant Scheme Guidelines

The application should be concise and informative and contains the following information (limit your

application to 4 pages):

Research proposal - 2 pages maximum

Bibliography - ½ page

Budget - ½ page

Curriculum Vitae – 1 page

Recommendation letter (or e-mail) from the supervisor supporting the applicant is mandatory and the research proposal must be sent directly to the Treasurer of IAS by the application deadline

Guidelines for letter from supervisor

The letter from the supervisor should provide an evaluation of the capability of the student to carry out the proposed research, the significance and necessity of the research, and reasonableness of the budget request. The letter must be sent directly to the Treasurer of IAS by post or e-mail by the application deadline (Patric Jacobs, Department of Geology and Soil Science, Ghent University, Krijgslaan 281/S8, B-9000 Gent, BELGIUM. E-mail: patric.jacobs@ugent.be). An application form is on our website (<http://www.iasnet.org>).

Grant application

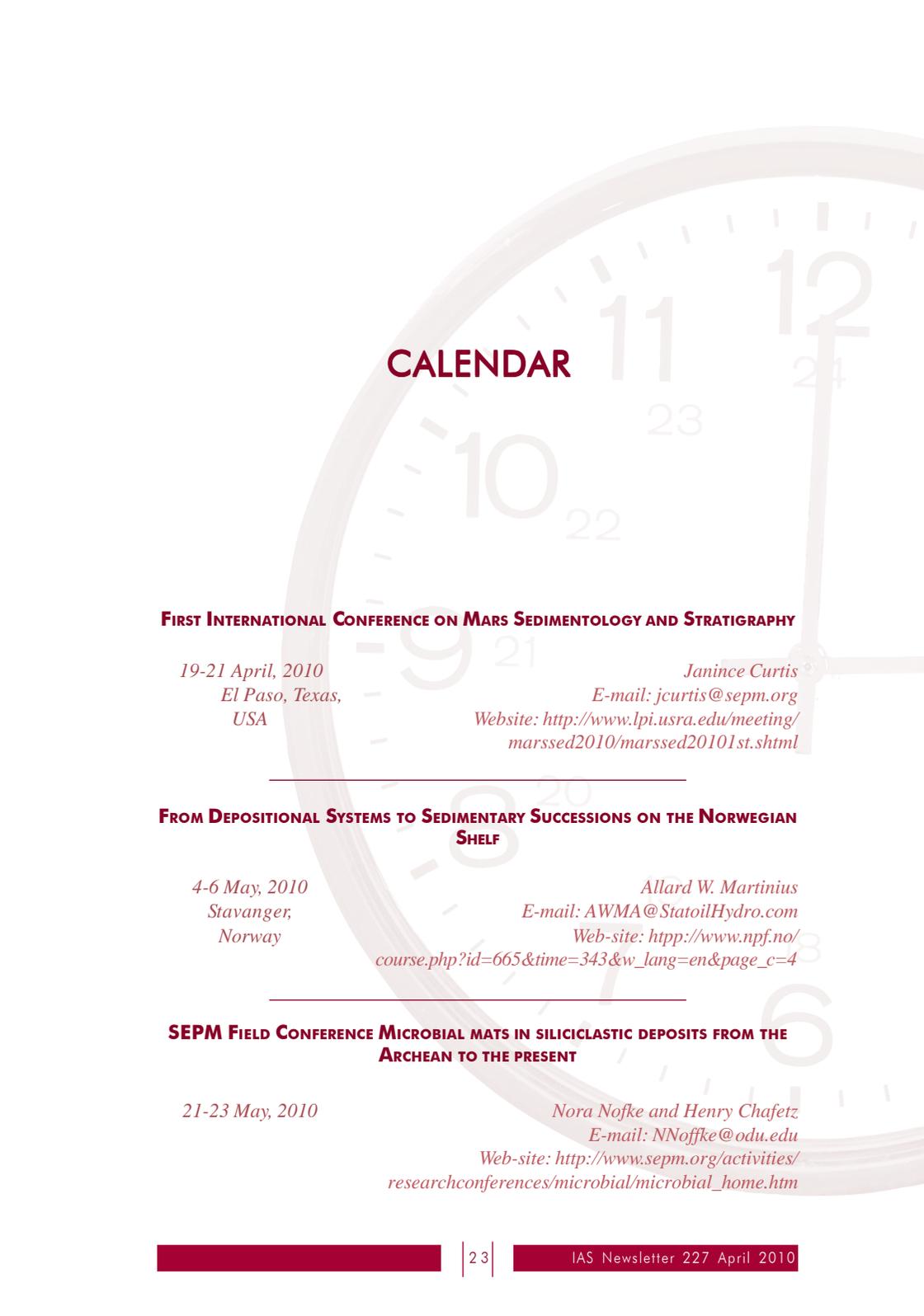
Research Proposal –

- ♦ **Title**
- ♦ **Introduction:** Introduce the

- topic and provide relevant background information; summarise previous work by you or others. Provide the context for your proposed study in terms of geography, geology, and /or scientific discipline.
- ◆ **Motivation:** It should have a clearly written hypothesis or a well-explained research problem of geologic significance. It should explain **why** it is important. Simply collecting data without an objective is not considered wise use of resources.
 - ◆ **Methods:** Outline the research strategy (methods) that you plan to use to solve the problem in the field and/or in the laboratory. Please include information on data collection, data analyses, and data interpretation.
 - ◆ **Facilities:** Briefly list research and study facilities available to you, such as field and laboratory equipment, computers, library.
 - ◆ **Bibliography:** provide a list of key (5-10) publications that are relevant to your proposed research. The list should show that you have done adequate background research on your project and are assured that your methodology is solid and that the project has not been done already.
 - ◆ **Budget:** Provide a brief summary of the total cost of the research. Clearly indicate the amount (in euros) being requested. State specifically what the IAS grant funds will be used for.
 - ◆ **Curriculum Vitae:** Name, postal address, e-mail address, university education (degrees & dates), work experience, awards and scholarships, independent research projects, your abstracts and publications.

Application deadlines: 1st session: March 31
2nd session: **September 30**

Recipient notification: 1st session: before June 30
2nd session: **before December 31**



CALENDAR

FIRST INTERNATIONAL CONFERENCE ON MARS SEDIMENTOLOGY AND STRATIGRAPHY

*19-21 April, 2010
El Paso, Texas,
USA*

*Janince Curtis
E-mail: jcurtis@sepm.org
Website: <http://www.lpi.usra.edu/meeting/marssed2010/marssed20101st.shtml>*

FROM DEPOSITIONAL SYSTEMS TO SEDIMENTARY SUCCESSIONS ON THE NORWEGIAN SHELF

*4-6 May, 2010
Stavanger,
Norway*

*Allard W. Martinus
E-mail: AWMA@StatoilHydro.com
Web-site: http://www.npf.no/course.php?id=665&time=343&w_lang=en&page_c=4*

SEPM FIELD CONFERENCE MICROBIAL MATS IN SILICICLASTIC DEPOSITS FROM THE ARCHEAN TO THE PRESENT

21-23 May, 2010

*Nora Nofke and Henry Chafetz
E-mail: NNofke@odu.edu
Web-site: http://www.sepm.org/activities/researchconferences/microbial/microbial_home.htm*



DEEP WATER CIRCULATION: PROCESSES & PRODUCTS *

16-18 June, 2010
Baiona (Pontevedra),
Spain

Francisco J. Hernández-Molina
University of Vigo
E-mail: contourites@uvigo.es
Website: <http://www.facultadeccdomar.es/contourites>

GEOEVENTS, GEOLOGICAL HERITAGE, AND THE ROLE OF THE IGCP

15 -18 September, 2010
Caravaca de la Cruz,
Spain

Marcos A. Lamolda
Universidad de Granada
E-mail: marcos.lamolda@gmail.com
Website: <http://www.ugr.es/~mlamolda/congresos/geoevents>

ANNUAL MEETING OF GeoSED (ITALIAN ASSOCIATION FOR SEDIMENTARY GEOLOGY)

19-25 September 2010
Torino,
Italy

Luca Martire
Dpt. Scienze della Terra, University of Torino
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LANDSCAPES INTO ROCK *

21-23 September,
2010
London, UK

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18TH INTERNATIONAL SEDIMENTOLOGICAL CONGRESS*

26 September,
1 October, 2010
Mendoza,
Argentina

Eduardo Piovano
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Avda. Velez Sarsfield 1611
X501GCA, Córdoba, Argentina
E-mail: epiovano@efn.uncor.edu
Website: <http://www.isc2010.com.ar>

CENTRAL AND NORTH ATLANTIC CONJUGATE MARGINS CONFERENCE

28 September-1
October, 2010
Lisbon, Portugal

Rui Pena dos Reis
University of Coimbra, Portugal
E-mail: penareis@dct.uc.pt
Website: <http://www.conjugatemarkins.com.pt/>

7TH INTERNATIONAL SYMPOSIUM ON EASTERN MEDITERRANEAN GEOLOGY

18-22 October, 2010
Cukurova University,
Adana, Turkey

Saziye Bozdog
E-mail: jeosempozyum@cu.edu.tr
Website: www.geology.cu.edu.tr/ISEMG2010/

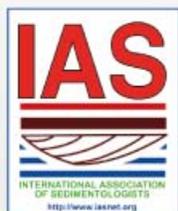


28TH IAS MEETING OF SEDIMENTOLOGY *

5-8 July, 2011
Zaragoza,
Spain

Marc Aurell
University of Zaragoza
E-mail: maurell@unizar.es

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