

International Geoscience Programme

IGCP

SPANISH NATIONAL COMMITTEE



Annual Meeting of the Spanish Committee at Zaragoza, on June 2nd 2009
(from left to right, first row: José A. Gámez, María Consuelo Sendino, Eladio Liñán, Consuelo Vázquez, José I. Valenzuela, Cristina Bauluz; second row: Rodolfo Gozalo, Blanca Bauluz, Jau-Chyn Liao, Marcos A. Lamolda, Ana Márquez; last row: Javier Lario, Bartolomé Andreo, Rosa Mediavilla, Marcos Aurell)

Annual Report for 2009

February, 2010

ANNUAL REPORT for 2009
IGCP Spanish National Committee

1. Prof. Dr. Marcos A. Lamolda (Chairman)
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(since 1999, pioner website of national committees)

2. Dr. V. Gabaldón and Dr^a. C. Antón-Pacheco (Instituto Geológico y Minero de España-IGME); Dr. Marcos Aurell (Sociedad Geológica de España-SGE); Dr. B. Andreo (513); Dr^a Blanca Bauluz (Sociedad española de Mineralogía-SEM); Dr. D. Brown (524); Dr. Ramon Carbonell (559); Dr. P. Domínguez (503); Dr. J. A. Gámez (493); Dr. A. García-Casco (546); Dr. Rodolfo Gozalo (Sociedad española de Paleontología-SEP); Dr. Gabriel Gutiérrez Alonso (574); Dr. A. Márquez (506); Dr. R. Mediavilla (CEICAG); D. C. Quesada (497); Dr. R. Sáez (502); Dr. Pablo G. Silva (567); Dr. J. I. Valenzuela (499); Prof. Dr. F. Vilas (526); Prof. Dr. C. Zazo (495).

3. IGCP projects in which Spanish Working Groups have participated

b) Project with Spaniard project co-leader

Project no. 502: 'Global comparison of Volcanic-hosted Massive Sulphide Districts'

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Spaniard co-leader: Dr. Fernando Tornos, IGME, Salamanca.

Abstract: During 2009, the IGCP 502 has been "On Extended Terms" and the activities of the Spanish Working Group in the project have been limited. Highlight the active participation of four members of the group at the International Workshop held in Marrakech last March. Also two manuscripts have been submitted as a contribution to the special issue of *Mineralium Deposita* to be published in 2010 including the most relevant results of IGCP 502.

Publications and contributions to congresses

The working group has a total of 4 publications, 2 as a part of the special volume devoted to results and achievement of the IGCP project no 502, in the international journal *Mineralium Deposita*. Two contributions to the international congress "*The VMS deposits of Morocco*", Marrakech, Morocco March 2009.

Project no. 513: 'Karst Aquifers and Water Resources'

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Spaniard co-leader: Dr. Bartolomé Andreo Navarro

Abstract: During 2008, the Spanish Chapter of IGCP 513 Project of UNESCO (GTE-513) has participated in several scientific meetings connected with karst, which were held in Spain and other places (Gibraltar, USA, Croatia). Investigations on Spanish karst cavities were performed. The results have permitted advances on the origin of karst cavities and speleothems formed inside them, on the infiltration processes and water -CO₂ flow through the unsaturated zone of carbonate aquifers, and on the changes in the microclimatic conditions of the caves as consequence of the tourist visits. The hydrogeological characterization of carbonate aquifers, both in natural regime and influenced conditions by pumping exploitation (sometimes overexploitation) has been other line of research developed together with the groundwater recharge assessment. In carbonate aquifers from several Spanish regions it has been studied the functioning of these systems using the discharge data and water table records from boreholes, as well as the chemical and isotopic composition of the water, even from a multi-tracer dye test. The GTE-513 has also investigated on protection of groundwater by vulnerability mapping and protection zoning around springs and wells used for water supply. The main results obtained by GTE 513 have been presented in national and international meetings and congresses and they have been published in international journals.

Visiting researchers

Two invited researchers paid their visits to the Universidad de Málaga, for study of common interest on Karst aquifers, physics Prof. Jens Lange (Fribourg University, Germany) and hydrogeochemistry topic (Prof. Jacques Mudry (Franche-Comté University, France) among French and Spanish localities.



The Villanueva del Rosario spring in the Alta Cadena karst area (Málaga Province, Spain)

Publications and contributions to congresses

The working group has a total of 6 publications in journals, and 4 contributions to congresses.

Project no. 524: 'Arc-Continent Collision'

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Spaniard co-leader: Dr. Dennis Brown
<http://www.ija.csic.es/gt/IGCP524>

Abstract: IGCP Project 524 focused on processes in zones of collision or accretion between volcanic island arcs and continental margins in both ancient and active settings. Since zones of arc-continent collision host much of the world's primary economic gold and copper, the search for new resources requires an understanding of the processes and geometries of accretion and the resulting crystal architecture. The island city of Orange, 200 km west of Sydney Australia, provided the setting for the third and final meeting of the IGCP 524. Orange is underlain by the Ordovician Macquarie Arc, an ancient and anomalous example of an accreted intra-oceanic arc system embedded within the Lachlan Orogen of south-eastern Australia that formed part of the Ordovician palaeo-Pacific margin of east Gondwana. 105 scientists attended including participants from Argentina, Brazil, Canada, China, Cuba, , Germany, Ireland, New Zealand, Papua New Guinea, Russia, Spain, UK and USA. The large local contingent reflected the thriving mining and exploration industry in the arc. Two pre- and two post-conference one day trips examined aspects of arc evolution and mineralisation, while other two post-conference field trips were also held. One visited the Cowal Gold Mine in the western belt of the Macquarie Arc. The other undertook a transect across the southwestern belt of the arc, examining relationships between, and structures of, the ophiolite belts, Macquarie Arc and adjacent craton-derived sedimentary (turbidite + chert + black shale) sequences in southern NSW.

Meeting organization

- Coordination meeting at Leenane, Ireland, June 5th, 2009, about a monographic book titled: "*Processes of arc-continent collision*", being edited by Dennis Brown and Paul Ryan, Springer Verlag is its Publisher. It will be available by Summer 2010.

Publications and contributions to congresses

The results of the Taiwan meeting have been published in a special issue of *Tectonophysics*, Brown, D., Huang, C.-Y. (eds.), 2009. *Arc-continent Collision*. *Tectonophysics* 479 (1,2), 196 pp. Brown, D., Ryan, P. (eds.) in press. *Processes of arc-continent collision*. Springer Verlag.

The working group has a total of 3 publications in journals, and 3 contributions to congresses.

Project no. 546: 'Subduction zones of the Caribbean'

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Spaniard co-leader: Dr. Antonio García Casco
<http://www.ugr.es/agcasco/pigc546/>

Abstract: We have arranged a stable group of scientist and students interested in the geology and social/economic development of the Caribbean region. We have produced a large number of scientific achievements concerning the age, geochemistry, petrology (P-T-t paths) and tectonic setting of formation of subduction related metamorphic and volcanic arc rocks, of Caribbean LIP rocks, and of sedimentary rocks of the Caribbean and the Proto-Caribbean basins. One synthesis book covering all these aspects is about to be published by the Geological Society of London (see below). Also, a special volume of *Geologica Acta* is being edited at this moment. During 2009 our activities have been tightly associated with the activities of the Cuban and Colombian Geological Societies, the projects of Andrew Kerr (Cardiff) on Caribbean LIP, the EU and Spanish MEC-MICINN projects of Javier Escuder (Madrid) on Hispaniola geology and Antonio García-Casco (Granada) on Cuban geology, from which we obtained financial support. The Spanish Committee for the IGCP, granted to Sandra Carrasquilla Ortiz, allowing her participation in the Pre-Congress Course "Metamorphic Petrology as a Geodynamic Tool", in the context of the III Cuban Convention in Earth Sciences, 15–25 March 2009. As a part of the project a MSc thesis has been presented at the University of Granada, "*Geología y Geoquímica del Complejo Majubina y su relación con el arco volcánico del Caribe (Cuba Central)*", by Sandra Carrasquilla Ortiz, available at <http://www.ugr.es/~agcasco/tierra/geologia/tesismaster09/carrasquilla.htm>

Meeting organization

Cuba 2009. 13-25 March 2009. La Habana, Cuba. Workshop "Subduction Zones of the Caribbean" (ca. 30 participants), and associated Field Trip "Subduction and arc complexes of central Cuba" (ca. 30 participants), in the context of the III Cuban Convention in Earth Sciences.

Cardiff 2009. 2-4 September 2009. Cardiff, Wales, UK, Workshop "Circum-Caribbean and North Andean tectonomagmatic evolution" (ca. 50 participants).

Colombia 2009. 7-13 September, 2009. Paipa, Bocayá, Colombia. Workshop "Advances in the tectonic evolution of the Caribbean" (> 50 participants). In the context of the XII Colombian Geological Congress.

San Francisco 2009. 14-18 December 2009. San Francisco, USA. Session T22 "Evolution of the Caribbean Plate: Linking its Tectonic, Magmatic, Metamorphic and Stratigraphic Records". In the context of the AGU Fall Meeting. Expected > 30 participants. See details at the website: <http://www.ugr.es/agcasco/igcp546/>

Post-graduated courses

Cuba 2009. 13-25 March 2009. La Habana, Cuba. Pre-Congress Course "Metamorphic Petrology as a Geodynamic Tool" (ca. 20 participants) in the context of the III Cuban Convention in Earth Sciences.

Stanford 2009. 1-18, May 2009. Stanford, USA. Course "Sedimentary Provenance Analysis and its bearing on subduction and strike-slip tectonics at the southwestern margin of the Caribbean. (5 attendants).

Colombia 2009. 7-13 September, 2009. Paipa, Bocayá, Colombia. Course "Tools for tectonic analysis in the Caribbean margin" (ca. 20 participants). In the context of the XII Colombian Geological Congress.

The working group published 10 papers in journals, and presented 19 contributions to meetings, and produced one field-trip guide for an international congress, and two geological maps E=1:50000, from the Dominican Republic.

Project no. 559: 'Crustal Architecture and landscape Evolution'

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Spaniard co-leader: Dr. Ramon Carbonell

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Abstract: This project focusses on that part of planet Earth that has the most significance for the world's communities, namely the Earth's crust, that outer part of the planet on which we all live. The project makes available to communities-at-large a wealth of information and seismic imaging that is commonly only available to research workers but yet has a profound effect on how we think of the landscapes, natural environments and their controlling geological processes and tectonic influences. IGCP Project 559 is a successor to IGCP Project 474 and delivers an international mechanism whereby specialist seismic researchers from all countries can meet at various sponsored conferences/symposia, can sponsor international student participation at conferences and symposia, and can disseminate information on seismic images of the Earth's crust and upper mantle that affect the lives of many communities on this planet. IGCP Project 559 sponsors international symposia every two years under the banner – Deep Seismic Profiling of the Continents and their Margins. The Next symposium in Cairns, Australia, in 2010 will be the 14th symposium in the series with a history going back to 1984. In addition, IGCP Project 559 sponsors sessions at other international relevant conferences such as the last IGC in Norway, 2008, and the forthcoming IGC in Brisbane during 2012, and various regional geoscientific conferences such as the European Geosciences Union General Assembly, 2009, in Vienna.

Contributions to congress

Two contributions to the European Geosciences Union General Assembly

c) Projects with active working groups

Project no. 495: 'Quaternary Land–Ocean Interaction'

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Outer Bank-South Carolina.
Sixth IGCP project no. 495 Annual Meeting, held in Myrtle Beach, South Carolina-USA. October 2009.

Abstract: Activities and results published in journal with high Impact Factor, and International books and journals most of them presented during specific Meetings and Congress, during which the opportunity to contrast ideas and methods is possible, show the great activity of our GTE. In order to understand all mechanisms and processes involved in sea-level changes. The use of several proxies at different temporal and special scale, have largely improved. Changes at millennial and submillennial scales have been recorded during the Present Interglacial (MIS 1) and Last Interglacial (MIS 5.5). The last one is globally considered to be a period warmer and with a sea level position 2 to 6 m higher than the present. Our investigations are geographically expanded, now including Tunisia, Açores, and Santo Domingo coasts. Littorals of Portugal peninsular, and Cape Verde continue under study. Research on coastal submarine areas have developed investigations on mapping and sedimentary environments. These studies are very important because they are necessary for highstand reconstruction. The record of high marine events such as storm surges and tsunamis together with its recurrence periods constitute an important research line in our Group. Two members of the Spanish working Group (J.Lario, and E.Leorri) attended the Sixth IGCP 495 Annual Meeting, held in Myrtle Beach, South Carolina-USA. October 2009.

PhD as product of the Spanish Working Group, IGCP Project no. 495

Ana Cabero. *Registro costero de los cambios eustáticos y climáticos durante los interglaciares recientes cuaternarios: Sur y Sureste peninsular, islas Baleares, Canarias y Cabo Verde*. Septiembre 2009, Universidad de Salamanca. Supervised by several members of the IGCP 495, SWG.

Meeting organization

1st INQUA-IGCP 567 International Workshop on Earthquake Archaeology and Paleoseismicity. 7-13 Sept. 2009. Bolonia, Cádiz.

J. Lario, C. Zazo, (C.C), A. Cabero, T. Bardají, J.L. Goy, J. Lario, C. Zazo (C.O)

VII Reuniao do Cuaternario Ibérico. O Futuro do Ambiente da península Ibérica- As Ligações do Passado Geológico Recente. 5-9 Octubre 2009, Faro-Portugal.

J. Rodríguez-Vidal (C.C), T. Bardají, J.L. Goy, J. Lario, C. Zazo (C.O)

Publications and contributions to congresses

The working group has a total of 10 publications in journals, and 15 contributions to meetings.

Project no. 499: 'Devonian land-sea interaction: Evolution of Ecosystems and Climate in the Devonian'

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Summary: Major contribution of the Spanish Working Group (SWG) during 2009 has been in the field of fine biostratigraphy, as this aspect of Geology is basic for other endeavours, such as precise chronologic arrangement of geological events that in turn is fundamental for, both palaeogeographical reconstructions and basin evolution. In this respect, basic palaeontology and its applications to biostratigraphy, chronostratigraphy and palaeogeography, is mandatory, as the SWG has done it. This year, besides the publications listed below, three PICG-499-related Ph. D. Thesis have been concluded (or are in the final stage); this fact shows the relevant contribution of the SWG in supporting, mentoring and coaching young researches.

The SWG is composed of 25 scientists (10 women), from 7 universities and IGME. 6 are Ph. D students, (as stated, three of them finishing this year).

During 2009 the main working regions for WG members have been: The Cantabrian Cordillera, The Iberian Cordillera, The Pyrenees, Ossa-Morena, the Catalan Coastal Ranges, Andorra, Bohemia, the Carnic Alps and Sardinia. Besides, and thanks to the cooperation with foreigners

scientists direct access to material and data from Central Asia (Uzbekistan and west Siberia), and the Rhein Slate Mountains has been made available to the group.

The main areas the SWG have focused its work are Cantabrian Mountains and the Pyrenees and, also, two have been the main paleontological groups studied by the members of the group: conodonts and brachiopods. Two of the three Ph. D. Thesis above-mentioned are focused on conodonts from the Pyrenees and the third one is devoted to a conodont-based analysis of perinorth-gondwanaland regions (Morocco, Sardinia, Pyrenees, Ardennes and Montaigne Noire). Ostracods studies on the Lower Devonian of the Pyrenees and Iberian Chains aiming at the establishment of an alternative zonation, which age is independently controlled by conodonts, stand out, as well.

The SWG has also been very active in international cooperation, as several collaborations have strengthened the relations with different regional groups that are also involved in the ICGP-499: Novosibirsk (Siberia), Italy (Modena and Cagliari Universities), Germany (Senckenberg Research Institute and University of Braunschweig) and Czech Republic (Academy of Sciences).



Annual Meeting of the Spanish Working of the IGCP Project 499.
September 2009, Ronda (Málaga, Spain).

Meeting organisation

Symposium on project topics, as a part of the XXV^a Jornadas de la Sociedad española de Paleontología, Ronda, Málaga, September 2009.

Visiting researchers

- Prof. Carlo Corradini and a graduate student, University of Cagliari, Italy, short visit and three months, respectively, at the Universidad de Valencia. Field-works in the Pyrenees.

- Mena Schemm-Gregory, University of Frankfurt, Senckenberg Institut, a short stay at the Universidad de Valencia, in September, for common research in Devonian palaeogeography.

Publications and contributions to congresses

The working group has a total of 5 publications in journals, 14 contributions to meetings.

Project no. 503: 'Ordovician Palaeogeography and Palaeoclimate'

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Abstract: For the last year, "On Extent Term", it is worth highlighting our large participation in the *Final IGCP 503 Closing Meeting* in Copenhagen (31 August to 4 September 2009), with five communication from Spain and collaborations involving six out of 13 group members. These contributions focused on brachiopods, cystoids, bryozoans and ichnofossils. In addition there have been communication sin the classic *Jornadas de la Sociedad Española de Paleontología* (XXVth edition). The publications mainly concerning sedimentological and stratigraphical studies of the Upper Ordovician, ichnotaxonomy and the presence of reworked Ordovician fossils in the Triassic of Avalonia. The WG has 16 members.

Publications and contributions to congresses

The working group has a total of 8 publication in journals, and 6 contributions to meetings during 2009, mainly in the *Final IGCP Closing Meeting*, Copenhagen, August 2009.

Project no. 506: 'Marine and Non-marine Jurassic'

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Jurassic succession in the Mount Ksour, Middle Atlas, Algeria.

Abstract: During the year 2009, the researches of the Spanish Working Group of the IGCP 506 have been engaged on several topics, which are directly related to the different working areas of the Triassic and Jurassic basins of the Iberian Peninsula (Iberian Chains, Betic Chains, Catalanian Coastal Ranges, Pyrenean Basin and Basq-Cantabrian Basin). During the period 2006-2009 the Spanish Working Group (SWG 506) has developed many original geological works, two doctoral dissertations (the first about Triassic Conodonts of the Iberian Peninsula and the second one about Triassic-Lower Jurassic bivalve genera revision), 76 publications and 70 national and international congress communications. Those are the results of our research activities as SWG of the IGCP 506 with thirty members, at the end of this project. On the other hand, the group is in disposition to keep in these topics in a future project.

Meeting organization

Symposium on project topics, as a part of the XXV^a Jornadas de la Sociedad española de Paleología, Ronda, Málaga, September, 2009.

Visiting researchers

Dr. Francis Hirsh, Naruto University, Japan, at the Universidad de Valencia during two weeks, February 2009.

Prof. Jingeng Sha, leader of the IGCP project no. 506, Geology and Paleontology Institute, Nanjing, China, at the Universidad de Valencia during one week in September 2009.

Publications and contributions to congresses

The working group has a total of 21 publications in journals, and 30 contributions to meetings.

Project no. 526: 'Risks, resources and Record of the Past on the Continental Shelf'

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IGCP 526 home: <http://igcp526.io.usp.br/>

Abstract: The different groups involved in the GTE 526 have participated in national and international programs and projects contributing with several multi-disciplinary approaches to a global knowledge of the continental shelf processes and characteristics. Among them it must be highlighted those related to environmental conditions, sediment dispersion and instability, paleoclimatic evolution and the application of various technologies, among others.

Publications and contributions to congresses

The working group has a total of 13 publications, and 30 contributions to meetings.

Project no. 567: 'Earthquake Archaeology'

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Summary: During the year 2009 the activities of the IGCP-567 Spanish Working Group (SPWG) were focused on the preparation, organization and celebration of the 1st INQUA-IGCP 567 International Workshop on Earthquake Archeology and Paleoseismology held in the Ancient

Roman City of Baelo Claudia (Tarifa, Cádiz). About 101 researchers of 29 different countries attended this scientific meeting, resulting in a total amount of 51 scientific contributions, 14 of them directly produced by members of the SPWG. Several invited conferences were held during the Workshop by relevant international researchers in the fields of Archaeoseismology, Paleoseismology and Active Tectonics, such as A. Michetti (IT, Presidente INQUA Focus Group on Paleoseismology); M. Sintubin (BEL. Leader IGCP-567); T. Rockwell (USA. Fault Trenching); J. McCalpin (USA. Paleoseismology); K. Hinzen (GER. Archaeoseismology); I.D. Papanikolaou (GRE. Active Faulting); A. Vött (GER. Tsunamis); R. Tatevossian (RUS. Paleoeearthquakes); N. Mörner (SWE. Liquefaction), among others. The organization of the workshop also included a two-days Field Course on Archaeoseismology attended by 56 of the 101 participants, most of them young scientist or researchers for developing countries. The workshop activities resulted in the publication of an Abstracts Volume (184 pp.), A Field-Guide Book (96 pp.) and A Field Training Course Notebook (65 pp. plus maps and files of Earthquake Archaeological Effects EAE). All these publications were published with the financial support of IGME, UNED and AEQUA the main national sponsors of the meeting. Aside the workshop during the year 2009 was also eventually published the Spec. Vol n° 136 of the Geological Society of London entitled "Paleoseismology: Historical and Prehistorical records of earthquake ground effects for seismic hazard assessment" co-edited by the Coordinator of the IGCP-567 SPWG. This publication also includes three papers of members of this WG. Contributions of members of the SPWG were also presented at different international meeting, basically thematic sessions included in the EGU Meeting 2009. Activities of the SPWG planned for the year 2010 are mainly focused in two points: A) Co-organization of a Special Sesion within the framework of the next EGU Meeting 2009: NH9.14 (Environmental hazards and Ancient Societies: Lessons from the past?); and B) The edition of an Special Vol. Of the Journal Quaternary International entitled Earthquake Archaeology and Paleoseismology co-edited by the SPWG Coordinator and one of the international leaders of the IGCP567 (Manuel Sintubin). It is also planned the attendance to two International meetings (Vienna and Thesaloniki) sponsored by the International Project during which will be organised the corresponding business-meetings, for which financial support is requested.



Meeting organization

1st INQUA-IGCP 567 International Workshop on Earthquake Archeology and Paleoseismology held at the Roman city of Baelo Claudia, Tarifa, Cádiz. September 7–13, 2009, organised by Pablo G. Silva & Klaus Reicherter.

Field Course on Paleoseismology and Archaeoseismology, Baelo Claudia, Tarifa, Cádiz. September 11 – 12 2009, organised by Klaus Reicherter & Pablo G. Silva.

Publications and contributions to congresses

K. Reicherter, A. Michetti. P.G. Silva (eds.) 2009. Historical and Prehistorical Records of Earthquake Ground Effects for Seismic Hazard Assessment. *Geological Society of London, Special Publications* 316.

This working group has a total of 7 publications, and 6 contributions to meetings.

4. National Committee activities, including summaries of research meetings, symposia, workshops, etc. held under the aegis of the Committee, and assistance (financial or in kind) extended to national project participants.

The Spanish National Committee (SNC) annual meeting was held at Zaragoza on June 2–3, 2009 with Prof. M. A. Lamolda in the chair. The University of Zaragoza allowed a site and other facilities to us. This meeting was attended by 13 participants, who were welcome by Prof. Eladio Liñán Guijarro, Professor of Paleontology. A representative of the Sudirección General de Programas Internacionales of the Spanish Ministry of Education and Science, Mrs. Cristina Bauluz, attended the meeting, giving us news about the policy of the ministry, and support to our activities. A representative of the Spanish Commission for Cooperation with UNESCO, Mrs. Consuelo Vázquez, attended the meeting offering the support of the Commission and the AECID (Ministry of Foreign Affairs) with its Project grants.



Annual Meeting of the IGCP Spanish Committee. Field-trip to Murero, Zaragoza, on June 3rd, 2009. Prof. Eladio Liñán addressing participants about the geological interest of this Cambrian locality.

The committee reviewed the projects newly adopted by the IGCP Scientific Board during its last session in middle February 2009 at Paris. A proposal for the Spanish Working Group, Project no. 525 “*Earthquake Archaeology*” was approved.

The Chairman of the SNC, according to the promotion policy of GTEs, of interest to Spaniard researchers, has nominated correspondents of both IGCP Project no. 559 “*Crustal Architecture and landscape Evolution*” and 574 “*Bending and Bent Orogens, and Continental Ribbons*”, as there are a relevant number of Spaniard researchers working in topics related with those projects.

The Chairman of the SNC gave a supporting letter to Dr. Roger Urgeles, for his proposal of a new Project, in collaboration with David Mosher, Jason Chaytor and Michael Strasser.

The Chairman of the SNC gave a supporting letter to : Dr. Adam D. Switzer, for his proposal of a new Project, in collaboration with Dr. Craig Sloss, Dr. Behamin Horton, and Dr. Yongqiang Zong.

This year has been a total of 15 working groups: GTEs project no. 493, 495, 497, 499, 502, 503, 506, 513, 524*, 526, 546*, 555*, 559*, 567 and 574* (* informal group, correspondent)
As results of working group activities, three monographies have been edited:

- K. Reicherter, A. Michetti. P.G. Silva (eds.) 2009. Historical and Prehistorical Records of Earthquake Ground Effects for Seismic Hazard Assessment. *Geological Society of London, Special Publications* 316.
- Brown, D., Huang, C.-Y. (eds.), 2009. Arc-continent Collision. *Tectonophysics* 479 (1,2), 196 pp.
- Brown, D., Ryan, P. (eds.) in press. *Processes of arc-continent collision*. Springer Verlag.

SWGs have produced a total of 87 papers, 3 special issues in peer review journals, and 2 geological maps. A total of 131 contributions to congress were presented. A field-guide was produced, 1 PhD Thesis and 1 Master Thesis have been finished as a part of the IGCP topics.

Field excursions: Two stops of the Field Trip 3, In: J. Lario, P.G. Silva, K. Reicherter, C. Grutzner and M.A. Rodriguez-Pascua (Eds.). Instituto Geológico y Minero de España, Madrid. (Dep. Legal M. 27206-2009)

- Cabero, A., Lario, J., Zazo, C., Goy, J.L., Dabrio, C.J., Borja, F., Roquero, E., Silva, P.G., García-Blázquez, A.M., Bardají, T., Hillaire-Marcel, C., Mercier, N. (2009). Field Trip 3: STOP 5 Geomorphologic setting and 1755? Tsunami deposits at Cape Trafalgar. *Palaeoseismicity and Active Tectonics during the Quaternary in the Gibraltar Strait (Betic Cordillera, South Spain)*, 74-84.

- Lario, J., Luque, L., Zazo, C., Goy, J.L., Dabrio, C.J., Cabero, A., Bardají, T. Silva, P.G. (2009). Field Trip 3: STOP 6 Tsunami deposits at Torre de Castilnovo, Conil de la Frontera. *Palaeoseismicity and Active Tectonics during the Quaternary in the Gibraltar Strait (Betic Cordillera, South Spain)*, 85-96.

5. IGCP meetings held during the year in Spain

The Spanish Working Groups of IGCP Project no. 567 with members of the IGCP Project 495 organised the Earthquake Archeology and Paleoseismology, Baelo Claudia, Tarifa (Cádiz, Spain), September 7 – 13, 2009.

A symposium with topics of IGCP projects no. 493 *The Rise and Fall of the Vendian Biota*, no. 499 *Devonian land-sea interaction: Evolution of Ecosystems and Climate in the Devonian*, and no. 506 *Marine and Non-marine Jurassic*, was organized in the XXVth Jornadas de la Sociedad española de Paleontología, held at Ronda, Málaga, 24 – 26 September 2009. A total of 24 contributions were presented.

The Spanish Working Group of IGCP Project no. 495 with Portuguese colleagues organised the VII Reunião do Cuaternario Ibérico. O Futuro do Ambiente da península Ibérica-As ligações do Passado Geológico Recente. Faro, Portugal, October 5 – 9, 2009.

6. IGCP meetings planned for the following year

- Last Annual Meeting of the IGCP Project no. 413 *Karst Aquifers and Water Resources*, as a part of the 4th International Symposium of Karst, organised by Spanish Working Group in the University of Málaga, from 27th to 30th April, 2010.

- 4th Annual International Meeting of the IGCP Project no. 526 *Risks Resources and Record of the Past on the Continental Shelf*, organised by the Spanish Working Group in the Facultad de Ciencias del Mar, Universidad de Vigo (Pontevedra), from September 28th to October 1st, 2010.

Spanish National Committee

- Annual Meeting at Granada, 15th March 2010.
- 35th Anniversary of the Spanish National Committee Symposium. September 15th –18th, 2010, at Caravaca de la Cruz (Murcia). This symposium is a part of the International Conference on

Goevents, Geological Heritage, and the Role of the IGCP, sponsored by the Caravaca Municipal Council, and auspiced by the Secretariat of the IGCP and the Comisión Nacional de Geología (Spanish Representative of the IUGS).

8. Forthcoming events available in connection with the Programme

* IV Curso de Hidrogeología Kárstica (HIDROKARST 2010), which will be held at the University of Málaga, on April 26th, 2010.

* Course on “Petrology, Geochronology and Tectonics” for Latin American senior scientists, at the University of Granada, in September 2010.

* Course on Marine Geology for graduate students, Mytilus research ship, Ria de Vigo, in late September 2010.

International Conference on Goevents, Geological Heritage, and the Role of the IGCP, Caravaca de la Cruz, September 15th to 18th, 2010

The Major of Caravaca de la Cruz, Murcia Region, Mr. Domingo Aranda, confirmed his support to this international conference by an official letter, what was presented to the IGCP Secretariat and Scientific Board, during the last session at Paris, on February 20th, 2009. An invitation letter, with the agreement of Mr. Robert Missotten, to chairmans of European National Committees was sent on May 14th. That letter was also sent to European co-leader of active IGCP projects. The organization has received positive answer from the following national committees: Albania, Austria, Bulgaria, Czech Republic, Germany, Macedonia, Poland, Russia, Serbia, Slovenia, Sweden, in addition to Spain, and co-leaders from projects no. 507 and 555.

Active and recently finished Spanish Working Groups will contribute, too. It is expected a dozen contributions.

3 keynotes about IGCP general topics, and 6 keynotes about Project topics will be read by representatives of IGCP Secretariat, Scientific Board, and Project co-leaders, respectively.

The Spanish Geological Survey, and the Sub-direction General of International Programmes, both of the Science and Innovation Ministry, the Spanish Commission for Cooperation with UNESCO, the European Association for the Conservation of Geological Heritage (ProGEO), the Conjunto Paleontológico de Teruel-Dinópolis Foundation, the Geological Heritage Commission of the Spanish Geological Society, the CEICAG, the Spanish Paleontological Society, the Spanish Mineralogical Society, the Regional Governments of Andalucía, Aragón and Murcia regions, and the Universities of Granada and Murcia, are collaborators of the conference.

The Second Circular of the conference has just been mailed.

This international Conference consists on three symposia:

- Goevents: learning on the Global Change
- IGCP European Regional Meeting
- ProGeo SW Europe Regional Meeting

9. Suggestions relating to the conduct and improvement of the Programme

It seems that temporal circumstances, often with weak support, may change well established research lines of the IGCP. A programme with a relevant impact on the Earth Sciences, transference of knowledge to developing countries and visibility of Earth Sciences among people.

An important trouble is caused by financement of the IGCP, and its projects. The annual budget has been reduced until 50% since 1995 to 2008. The adaptation to this dramatic budget reduction has induced a less number approved projects. In fact, the number of Projects has undergone a reduction of 40%, from 50 to 33, through the same period of time. Unfortunately, this is not the only trouble as the financement per Project has also decreased, from an average of 7000\$ to 5000\$. Either the small number of projects as the lower average financement are the main actual problems of the IGCP. Actually, with five main research lines, 30 projects are a risk to keep topic diversity, one of the great advantages of the IGCP. Furthermore, an average budget of 5000\$ per year/Project is almost a nominative financement, and may produce non-working projects. Both

circumstances might cause a doubtful viability of the IGCP, which allowed to keep its aims with a topic diversity representative of the whole Earth Sciences, such as it has been until today.

10. Financial support received for the activities of this National Committee, and given to IGCP projects and their activities

Committee activities have been financed by a grant, ACI no. PCI2006-A5-0584 (18000 euro, a part was used for financing year 2008 activities), Ministerio de Educación y Ciencia, and a grant of the Instituto Geológico y Minero de España with an amount of 2314 euro, for the following actions:

- Annual meeting of the IGCP Spanish Committee, held at Zaragoza on June 2 and 3, 2009. The meeting was attended by 13 members, with representatives of Spanish Geological Society, Spanish Mineralogical Society, and Spanish Paleontological Society. Representatives of Spanish Commission for Cooperation with UNESCO, IGME, Science and Innovation Ministry, attended the meeting, too.
- The Chairman of the Spanish Committee attended the 37th Session of the IGCP Scientific Board, held at Paris on February 18–20, 2009. He presented a proposal for an International Conference “Geoevents, Geological Heritage, and the Role of the IGCP”, as the year 2010 is the 35th Anniversary of the Spanish Committee.
- Meeting of the Chairman of the Spanish Committee with the Major of Caravaca de la Cruz to coordinate activities related to the above mentioned international conference.
- Meetings of the Chairman of the Spanish Committee with both Director General, IGME, and Sub-Director General of International Programmes, MICINN, to present the international conference and ask their support.
- Two geological missions of the Chairman of the Spanish Committee to prepare the international conference above mentioned.
- Meeting of the Chairman of the Spanish Committee, with a representative of the Ronda council and organisers of the XXVth Jornadas de la Sociedad española de Paleontología, to prepare the IGCP symposium in such a meeting.
- Geological missions of Spanish Working Group, 493, 495, 499, 503, and 513 to prepare the IGCP symposia at Ronda (Málaga) and Caravaca de la Cruz (Murcia).
- Dr. Antonio García Casco, co-leader of the Project no. 546, and a member of the Spanish Working Group attended the international meeting of the Project, held at Havana, Cuba, March 2009.
- Participation of Dr. Reinaldo Sáez, co-ordinator of the Spanish Working Group, Project 502, and two members of the group, attended the international meeting of the Project, at Rabat, Morocco, March 2009.

The Spanish Working Group of Project no. 524, 12000 euro grant (Ministerio de Educación y Ciencia) allowed the organisation (a part) of the Third and Final Workshop of IGCP 524: *Continent-Island Arc Collisions: How Anomalous is the Macquarie Arc?*, at Orange, New South Wales, Australia, 13-22 April, 2009. The attendance of the Spaniard co-leader to the Coordination meeting at Leenane, Ireland, June 5th, 2009.

The printing cost of the “Boletín Informativo” no. 33 January 2009, was financed by the Instituto Geológico y Minero de España (IGME), as it did during the last years. Mail distribution costs were allowed by both the IGME, and the University of Granada.

The University of Granada (Depto. de Estratigrafía y Paleontología), provides general services what allowed to this Chairman to accomplish his duty appropriately.

Most of the activities related to Spanish Working Groups have been financed directly by research projects of the participants, granted by the Spanish government, Regional governments, and other institutions.

Granada, February 15th 2010

Marcos A. Lamolda
Chairman, Spanish National Committee, IGCP