

GEOLOGY
FACULTY OF SCIENCE
UNIVERSITY OF ZARAGOZA

INDEX

INTRODUCTION	3
BSc IN GEOLOGY	5
MSc IN GEOLOGY: TECHNIQUES AND APPLICATIONS	9
RESEARCH GROUPS IN GEOLOGY	11

INTRODUCTION

FACULTY OF SCIENCE

The Faculty of Science is located at the heart of Zaragoza city, in San Francisco Campus. It has a long history of excellence in teaching and research. The Faculty has a strong international profile and attracts students from Europe and around the world. With more than 1,000 ISI journal articles published per year, the Faculty is a leading research hub at the University of Zaragoza, ranked among the top 200 world-class universities for Natural Sciences & Mathematics (ARWU 2016).

Figures for the Faculty of Science:

- 1850 students
- 450 professors + 100 researchers + 100 support staff
- 40 classrooms + 20 teaching labs + 150 research labs + 9 computer classrooms

Undergraduate Degree Programs

- BSc in Biotechnology
- BSc in Chemistry
- BSc in Geology
- BSc in Mathematics
- BSc in Optics and Optometrics
- BSc in Physics

MSc Degree Programs

- MSc in Geology: Techniques and applications
- MSc in Industrial Chemistry
- MSc in Mathematical modelling and research, Statistics and Computation
- MSc in Molecular and Cellular Biology
- MSc in Quantitative Biotechnology (*in English*)
- MSc in Molecular Chemistry and Homogeneous Catalysis
- MSc in Physics and Physical technologies
- MSc in Nanostructured Materials and Nanotechnological Applications (*in English*)
- MSc Erasmus Mundus in Membranes Engineering (*in English*)

English-language friendly (ELF) modules

Three of our MScs are taught in English, while the rest of MScs and all the BScs are taught in Spanish. However, in the programs taught in Spanish, most of the modules are English-language friendly. This means that, in those modules, foreign students will have, upon request:

- Learning material in English.
- Office hours in English.
- Assessment (exams, homework...) in English.

In the list of modules for each program, see below, English-language friendly modules for 2018/2019 are marked with an ^{ELF} label. The list of ELF modules may change slightly by 2019/2020; a list for that year will be available some weeks before the start of the classes.

High level research: More than 1.000 research papers in JCR per year

The Faculty has been the seed of Research Institutes of the University of Zaragoza:

- BIFI: Institute of Biocomputation and Physics of Complex Systems
- ICMA: Aragon Materials Science Institute
- INA: Institute of Nanoscience of Aragon
- ISQCH: Institute of Chemical Synthesis and Homogeneous Catalysis
- IUCA: Environmental Science Institute of Aragon
- IUMA: Institute of Mathematics and Applications

Most professors/researchers in the Faculty of Science are members of these institutes.

BSc IN GEOLOGY

Duration: 4 years full time. 60 ECTS per year.

Language: Spanish

Presentation:

The Aragonese territory is characterized by the great diversity of its geological record, reflected in a wealth of points of geological interest. This richness is distributed in three morphostructural units: Pyrenees, Ebro Basin and Iberian Range. Its diversity of landscapes, its mineral, energetic and water resources, and its geological and paleontological record place Aragon in a privileged position to study geology in all its fields. Much of the pioneering geologic works of Spain took place in this territory, and it is traditional that foreign geologists visit the region to develop their research and/or teaching. The important geological heritage of Aragon makes the region a privileged place that can be considered a nature classroom. All fields of geology are represented in the BSc in Geology of the Faculty of Science of the University of Zaragoza, allowing the future geologists to acquire a plural and versatile vision for their careers.

Program aims:

The BSc in Geology aims at training professionals able to develop their activity safeguarding the ethical code and being aware of the need to establish environmental respectful relations. With such a goal, it offers the students training in the Geology and Earth Sciences fields, through an interdisciplinary academic training combining basic scientific subjects with others specialized in the different fields of Geology, which will enable graduates to successfully meet current and future employment needs for this discipline.

The main objectives are:

- To know and apply the concepts, principles and basic methods of Geology.
- To apply this knowledge to the exploration and exploitation of natural resources, to the evaluation and mitigation of geological hazards or to the civil engineering.
- To understand and interpret the history of the Earth and of life from the geological and paleontological records.
- To understand the past, present and future interactions between the natural and the human environments, and to analyze and predict its effects.

Structure:

Year 1. In the first year students must enrol in the following modules:

Module	ECTS	Semester
26405 - Mathematics ^{ELF}	8	YL
26403 - Physics	9	YL
26401 - Biology	6	S1
26404 - Fundamentals of Geology and Geological Mapping ^{ELF}	9.5	S1
26407 - Chemistry ^{ELF}	6	S1
26402 - Crystallography ^{ELF}	6.5	S2
26406 - General and Marine Palaeontology ^{ELF}	9	S2
26400 - Stratigraphic Analysis ^{ELF}	6	S2

S1: Semester 1. Mid-September to mid-January

S2: Semester 2. Beginning-February to end-May

YL: Year-long. Mid-September to end-May

^{ELF}: English-language friendly module (see first page)

Year 2. In the second year students must enrol in the following modules:

Module	ECTS	Semester
26409 - Geomorphology ^{ELF}	8.5	YL
26411 - Mineralogy ^{ELF}	8.5	YL
26414 - Sedimentary Processes and Environments	9	YL
26415 - Statistical and IT Analyses of Geological Data ^{ELF}	6	S1
26408 - Structural Geology (English)	9	S1
26410 - Hydrogeology ^{ELF}	7	S2
26412 - Continental Palaeontology ^{ELF}	6	S2
26413 - Sedimentary Petrology ^{ELF}	6	S2

Year 3. In the third year students must enrol in the following modules:

Module	ECTS	Semester
26422 - Igneous and Metamorphic Petrology ^{ELF}	9	YL
26416 - Geological Mapping ^{ELF}	9	S1
26417 - Stratigraphic Correlation and Synthesis ^{ELF}	7	S1
26418 - Geophysics and Global Tectonics ^{ELF}	6	S1
26420 - Geochemistry ^{ELF}	7	S1
26419 - Historical and Regional Geology & Geology of Spain ^{ELF}	9	S2
26421 - Micropalaeontology ^{ELF}	6	S2
26423 - Mineral and Energy Resources ^{ELF}	7	S2

Year 4. In the fourth year students must enrol in the following modules:

Module	ECTS	Semester
26424 - Environmental Geology ^{ELF}	6	S1
26425 - Geotechnics and Geophysical Prospecting ^{ELF}	7	S1
26426 - Projects and Legislation in Geology ^{ELF}	6	S2
26427 - Geological Hazards ^{ELF}	6.5	S2
26428 – Undergraduate Dissertation *	9.5	YL

In this fourth year they must also select five modules from the list of optional modules:

Module	ECTS	Semester
26429 - Basin Analysis	5	S1
26430 - Structural Analysis: Techniques and Applications ^{ELF}	5	S1
26443 - Remote Sensing ^{ELF}	5	**
26441 - Applied Sedimentology and Coal & Petroleum Geology ^{ELF}	5	S1
26440 - Industrial Rocks and Minerals ^{ELF}	5	S1
26437 - Vertebrate and Human Palaeobiology ^{ELF}	5	S1
26435 - Applied Geochemistry ^{ELF}	5	**
26431 - Geomorphological and Geoenvironmental Mapping ^{ELF}	5	S2
26434 - Clay Geology ^{ELF}	5	S1
26436 - Engineering Geology ^{ELF}	5	S2
26438 - Technics in Paleontology ^{ELF}	5	S2
26442 - Tectonics: Basins and Orogens ^{ELF}	5	S2
26444 - Mineral Deposits ^{ELF}	5	S2
26432 - Teaching and Public Understanding of Geology	5	**
26433 - Fundamentals of Petrogenesis	5	**

Not all the optional modules are available every year. A list of the available modules for the following year (starting in September) is published in June. The modules with ** in the Semester column are not being offered in 2018/2019.

***Undergraduate Dissertation**

The Undergraduate Dissertation (UD) is a 250 hour work project on any of the modules of the Degree. It is undertaken during the 4th year. Student are supervised by a professor who defines the objectives of the Project and guides them along the work. Students must write a report and make a public defense of the work. The following list includes some examples of UD's performed in the last years.

- Analysis of the geochemical evolution of subsurface waters in overburden materials of a crystalline zone (Forsmark, Sweden).
- Petrology and mineralogy of volcanoclastic materials and enclaves of Denuy (Castanesa Valley, Huesca).

- Geomorphology of the Molino de Aso cave (Añisclo, Huesca)
- Structure and evolution of the Neogene-Quaternary basin of Valdecebro (Teruel)
- Cyclostratigraphy of the Danian-Selandian transition (Paleocene) of Zumaia (Gipuzkoa) with planktonic foraminifera and clay minerals
- The vein 7/5 of the Bou Azzer district (Morocco): Mineralogical and textural study
- Study of active landslides in the Valle de Tena (Huesca) through geomorphological mapping.
- Analysis of potential environmental risks in the basement of Maestrazgo linked to projects of unconventional gas extraction by hydraulic fracturing.
- Magmatism of the Atienza area (Guadalajara): Geological mapping, structural study, petrology and geochemistry, and emplacement model.
- The Anglas quarry (Central Pyrénées, France): Mineralogical and textural characterization.
- The Jurassic-Cretaceous transition in the environment of Camarillas and Aguilar del Alfambra (Teruel).
- Study of hyperthermal events of the Eocene through biometric analysis of benthic foraminifera.
- Stratigraphy and tectonics of the Tertiary in the area of Nigüella-Mesones de Isuela (Zaragoza).
- Sedimentological analysis of carbonate platforms in the late Jurassic (Higueruelas Fm., Mezalocha).
- Structural study of the NW end of the Macizo de Montalban (between Segura de Baños and Maicas)
- Structure of the western limb of the Boltaña anticline. Tectono-sedimentary features.
- Structural and sedimentary analysis of a sector located in the Puertos de Beceite area (Teruel).

MSc IN GEOLOGY: TECHNIQUES AND APPLICATIONS

Duration: 1 year full time. 60 ECTS.

Language: Spanish.

Program aims:

Modern and contemporary knowledge has been characterized by an excessive subdivision of disciplines, having little information flow among them. Geological Sciences are not an exception, making difficult the understanding of Earth as an interconnected system. To cope with that shortcoming, the MSc in Geology: Techniques and Applications offers a broad spectrum of topics with a large percentage of cross-curricular and multidisciplinary contents, both in core and optional modules. The core modules are designed to give the student a comprehensive training in: (i) instrumental techniques common to many geodisciplines, (ii) data management tools, and (iii) communication skills for technical and non-technical audiences. This cross-curricular learning provides the student with a very useful set of tools that are not usually included in MSc courses. Moreover, students have a wide optional module choice, which allows designing specific academic career paths, focused either on research or on a professional career.

Structure:

Students must enrol in the following compulsory modules:

Module	ECTS	Semester
60430 - Methods and techniques in Geology ^{ELF}	12	S1
60431 - Analysis, visualization and modelling of geological data ^{ELF}	10	S1
60432 - Scientific and technical communication skills ^{ELF}	6	S1
60443 – Master’s Dissertation ^{ELF} *	12	YL

Additionally, students must select 4 modules from the following list:

Module	ECTS	Semester
60433 - Paleontology and dynamics of the biosphere ^{ELF}	5	S2
60434 - Economic and applied mineralogy ^{ELF}	5	S2
60435 - The Earth: processes and interactions at large scales ^{ELF}	5	S2
60436 - Facies analysis and sedimentary models: principles and applications ^{ELF}	5	S2

60437 - Geohazards analysis and mitigation methods ^{ELF}	5	S2
60438 - Subsurface geology ^{ELF}	5	S2
60439 - Climatic changes, associated events and geologic record ^{ELF}	5	S2
60440 - Underground geological repositories ^{ELF}	5	S2
60441 - Integrated basin analysis ^{ELF}	5	S2
60442 - Characterization of geological materials: techniques and applications ^{ELF}	5	S2

***Master's Dissertation**

The Master's Dissertation (MD) is a 300 hour compulsory project. Student are supervised by a professor who defines the specific objectives of the Project and guides them along the work. Students must write a report and make a public defense of it. The following list includes some examples of MDs offered in previous years:

1. Weathering-related textural and mineralogical changes in alabaster.
2. Preliminary biozonation with planktonic foraminifera of the Itziar and Aguinaga Formation between Deba and Zumaya (Basque Country, N Spain).
3. Sedimentology and synsedimentary tectonics of the Artoles Formation in the Miravete Anticline (Iberian Chains, Teruel, Spain)
4. The Stegosaurids (Dinosauria, Ornithischia) of the Villar del Arzobispo Formation (Titanian) of Valencia (E Spain).
5. Morphometric analysis of teeth in Pleistocene venomous mammals.
6. Palaeohistologic characterization of the Barremian (Lower Cretaceous) Ornithischians from Cantalera (Teruel, Spain).
7. Characterization of the mixed terrigenous-carbonate coastal systems from the end of the Jurassic (Villar del Arzobispo Formation, Galve, Aragón, Spain)
8. Low-frequency climate cyclicity analysis in lacustrine sediments of the Enciso Group (Lower Cretaceous of the Cameros basin, La Rioja, Spain), with applications to the correlation and dating of the series.
9. Trenching study of gravitational structures in evaporite karsts.
10. Mineralogy and phase relations in the Co-Fe-Ni arsenides of the Aït-Ahmane (Bou-Azzer, Morocco) deposit. Differences with other deposits.

RESEARCH GROUPS IN GEOLOGY

- **Aragosaurus. Palaeoenvironmental and geological resources.** Responsible researcher: Ignacio Canudo
- **Extinction and paleoenvironmental reconstruction since Cretaceous to Quaternary.** Responsible researcher: Beatriz Azanza
- **Geoambiental processes and global change.** Responsible researcher: Blas L. Valero
- **Geotranfer.** Responsible researcher: Carlos Liesa
- **Geochemical Modelling.** Responsible researcher: Luis F. Auqué

RECENT SELECTED PUBLICATIONS

Arenas, C., Osácar, C., Auqué, L.F., Andrews, J.E., Pardo, G., Marca, A., Martín-Bello, L., Pérez Rivas, F.J. (2018). Seasonal temperatures from $\delta^{18}\text{O}$ in recent Spanish tufa stromatolites: Equilibrium redox. *Sedimentology*. 65: 1611–1630.

Arenillas, I., Arz, J.A., Gilabert, V. (2018). Blooms of aberrant planktic foraminifera across the K/Pg boundary in the Western Tethys: causes and evolutionary implications. *Paleobiology* 44(3): 460-489.

Arreguín-Rodríguez, G. J., Thomas, E., D’haenens, S., Speijer R.P., Alegret, L. (2018). Early Eocene deep-sea benthic faunas: Recovery in globally warm oceans. *PlosONE*, 13(2): e0193167.

Asta, M.P., Gimeno, M.J., Auqué, L.F., Galve, J.P., Gómez, J., Acero, P., Lapuente, P. (2017). Temporal variability of secondary processes in alkaline geothermal waters associated to granitic rocks: The caldes de boí geothermal system (Spain). *Geologica Acta*. 15- 2: 67-87.

Asta, M. P., Auqué, L.F., Sanz, F.J., Gimeno, M. J., Acero, P., Blasco, M., García-Alix, A., Gómez, J., Delgado-Huertas, A., Mandado, J. (2017). Travertines associated with the Alhama-Jaraba thermal waters (NE, Spain): Genesis and geochemistry. *Sedimentary Geology*. 347: 100 - 116.

Aurell, M., Bádenas, B., Gasca, J.M., Canudo, J.I., Liesa, C.L., Soria, A.R., Moreno-Azanza, M., Najes, L. (2016). Stratigraphy and evolution of the Galve sub-basin (Spain) in the middle Tithonian–early Barremian: Implications for the setting and age of some dinosaur fossil sites. *Cretaceous Research* 65, 138-162.

Aurell, M., Soria, A.R., Bádenas, B., Liesa, C.L., Canudo, J.I., Gasca, J.M., Moreno-Azanza, M., Medrano-Aguado, E., Meléndez, A. (2018). Barremian synrift depositional sequence evolution in continental to restricted bay environments with high diversity of vertebrates (Blesa Formation, Oliete sub-basin, NE Spain). *Journal of Iberian Geology*. 44(2): 285-308.

Bañuls-Cardona, S., Martín Rodríguez, P., López-García, J.M., Morales, J.I., Cuenca-Bescós, G., Vergès, J.M. (2017). Human impact on small-mammal diversity during the middle- to late-Holocene in Iberia: The case of El Mirador cave (Sierra de Atapuerca, Burgos, Spain). *Holocene*. 27(8), 1067-1077.

Benito-Calvo, A., Gutiérrez, F., Martínez-Fernández, A., Carbonel, D., Karampaglidis, T., Desir, G., Sevil, J., Guerrero, J., Fabregat, I., García-Arnay, A. (2018). 4D monitoring of active sinkholes with a Terrestrial Laser Scanner (TLS): A case study in the evaporate karst of the Ebro Valley, NE Spain. *Remote Sensing*. 10: 571.

Blasco, M., Auqué, L.F., Gimeno, M.J., Acero, P., Asta, M.P. (2017). Geochemistry, geothermometry and influence of the concentration of mobile elements in the chemical characteristics of carbonate-evaporitic thermal systems. The case of the Tiermas geothermal system (Spain). *Chemical Geology*. 466: 696–709.

Blasco, M., Auqué, L.F., Gimeno, M.J. (2017). Application of different geothermometrical techniques to a low enthalpy thermal system. *Procedia Earth and Planetary Sciences*. 17: 65 - 68.

Blasco, M.; Gimeno, M.J.; Auqué, L.F. (2017). Comparison of different thermodynamic databases used in a geothermometrical modelling calculation. *Procedia Earth and Planetary Sciences*. 17: 120-123.

Blasco, M., Auqué, L.F., Gimeno, M. J. (2017). Estudio geotermométrico de las aguas termales ricas en CO₂ del acuífero de La Ermita del Saladillo (Murcia). *Geogaceta*. 61: 115-118.

Blasco, M., Gimeno, M.J., Auqué, L.F., Mandado, J., Asta, M.P.; Acero, P. (2017). Evaluation of the Oxygen isotope fractionation in aragonitic travertines from the Fitero Thermal Springs (Navarra, Spain). *Macla*. 21: 14–16.

Canudo, J.I. (2018). The collection of type fossils of the Natural Science Museum of the University of Zaragoza (Spain). *Geoheritage* 10: 385-392.

Castanera, D., Pascual, C., Canudo, J.I., Barco, J.L. (2018). Bringing together research, geoconservation and reaching a broad public in the form of a geotourism project: the Ichnite Route of Soria. *Geoheritage*. 10: 393-403.

Casas-Sainz, A.M., Román-Berdiel, T., Oliva-Urcia, B., García-Lasanta, C., Villalaín, J.J., Aldega, L., Corrado, S., Caricchi, C., Invernizzi, C., Osácar, M.C. (2017). Multi-disciplinary approach to the study of fault zones at shallow depths: a case study from the Cameros-Demanda thrust (North Spain). *International Journal of Earth Sciences* 106, 1023-1055.

Cuenca-Bescós, G., Rosell Ardévol, J., Morcillo-Amo, Á., Galindo-Pellicena, M., Santos, E., Moya Costa, R. (2017). Beavers (Castoridae, Rodentia, Mammalia) from the Quaternary sites of the Sierra de Atapuerca, in Burgos, Spain. *Quaternary International*. 433: 263-277

De Miguel, D., Azanza, B., Morales, J. (2018). Regional impacts of global climate change: a local humid phase in central Iberia in a late Miocene drying world. *Palaeontology* (en prensa, doi: 10.1111/pala.12382).

De Miguel, D., Rook, L. (2018). Understanding climate's influence on the extinction of *Oreopithecus* (late Miocene, Tusco-Sardinian paleobioprovince, Italy). *Journal of Human Evolution* 116: 14-26.

Desir, G., Gutiérrez, F., Merinio, J., Carbonel, D., Benito-Calvo, A., Guerrero, J., Fabregat, I. (2018). Rapid subsidence in damaging sinkholes: Measurement by high-precision leveling and the role of salt dissolution. *Geomorphology*. 303: 393-409.

Díez-Berenguer, E., Badiola, A., Moreno-Azanza, M., Canudo, J.I. (2018). First adequately-known quadrupedal sirenian from Eurasia (Eocene, Bay of Biscay, Huesca, northeastern Spain). *Scientific Reports*. 8(1), 5127.

Ezquerro, L., Moretti, M., Liesa, C.L., Luzon, A., Pueyo, E.L., Simon, J.L. (2016). Controls on space-time distribution of soft-sediment deformation structures: Applying palaeomagnetic dating to approach the apparent recurrence period of paleoseisms at the Conclud Fault (eastern Spain) . *Sedimentary Geology* 344, 91-111.

Gasca, J.M., Moreno-Azanza, M. Bádernas, B. Díaz-Martínez, I., Castanera, D, Canudo, J.I., Aurell, M. (2017). Integrated overview of the vertebrate fossil record of the Ladruñán anticline (Spain): evidence of a Barremian alluvial-lacustrine system in NE Iberia frequented by dinosaurs. *Palaeogeography, Palaeoclimatology, Palaeoecology*. 472: 192-202.

García-Lasanta, C., Román-Berdiel, T., Oliva-Urcia, B., Casas, A. M., Gil-Peña, I., Speranza, F., Mochales, T. (2016). Tethyan versus Iberian extension during the Cretaceous period in the Eastern Iberian Peninsula: insights from magnetic fabrics. *Journal of the Geological Society*, London 173, 127-141.

Griira, C., Karoui-Yaakoub, N., Negra, M.H., Rivero-Cuesta, L., Molina, E. (2018). Paleoenvironmental and ecological changes during the Eocene-Oligocene transition based on foraminifera from the Cap Bon peninsula in North East Tunisia. *Journal of African Earth Sciences*, 143: 145-161.

Gutiérrez, F., Gutiérrez, M. (2016). Landforms of the Earth. An illustrated guide. Springer,

Dordrecht, 270 p.

Gutiérrez, F., Lizaga, I. (2016). Sinkholes, collapse structures and large landslides in an active salt dome submerged by a reservoir. The unique case of the Ambal ridge in the Karun River, Zagros Mountains, Iran. *Geomorphology*. 254: 88-103.

Gutiérrez, F., Fabregat, I., Roqué, C., Carbonel, D., Guerrero, J., García-Hermoso, F., Zarroca, M., Linares, R. (2016). Sinkholes and caves related to evaporite dissolution in a stratigraphically and structurally complex setting, Fluvia Valley, eastern Spanish Pyrenees. Geological, geomorphological and environmental implications. *Geomorphology*. 267: 76-97.

Gutiérrez, F., Zarroca, M., Castañeda, C., Carbonel, D., Guerrero, J., Linares, R., Roqué, C., Lucha, P. (2017). Paleoflood records from sinkholes. An example from the Ebro River floodplain, NE Spain. *Quaternary Research*. 88: 71-88.

Gutiérrez, F., Zarroca, M., Linares, R., Roqué, C., Carbonel, D., Guerrero, J., McCaillin, J.P., Comas, X., Cooper, A.H. (2018). Identifying the boundaries of sinkhole and subsidence areas and establishing setback distances. *Engineering Geology*. 233: 255-268.

Fabregat, I., Gutiérrez, F., Roqué, C., Comas, X., Zarroca, M., Carbonel, D., Guerrero, J., Linares, R. (2017). Reconstructing the internal structure and long-term evolution of hazardous sinkholes combining trenching, electrical resistivity imaging (ERI) and ground penetrating radar (GPR). *Geomorphology*. 285: 287-304.

Liesa, C.L., Rodríguez-López, J.P., Ezquerro, L., Alfaro, P., Rodríguez-Pascua, M.A., Lafuente, P., Arlegui, L., Simón, J.L. (2016). Facies control on seismites in an alluvial-aeolian system: The Pliocene dunefield of the Teruel half-graben basin (eastern Spain). *Sedimentary Geology* 344, 237-252.

Luzón, A., Gauthier, A., Pérez, A., Pueyo-Anchuela, O., Mayayo, M.J., Muñoz, A. (2017). Late Pleistocene-Holocene palaeoenvironmental evolution of the Añamaza River valley (Iberian Range, NE Spain): Multidisciplinary approach on the study of carbonate fluvial systems. *Quaternary International* 437, 51-70.

Morales, M., Peláez-Campomanes, P., Pérez, P., Alberdi, M.T., Azanza B., Pickford, M., Ríos, M., Sanisidro, M.O., Alcalde, G.M., Cantalapiedra, J.M., Fraile, S., García-Yelo, B. Gómez-Cano, A.R. Hernández-Ballarín, A., Oliver, A., Cantero, E., Valenciano, A., Montoya, P. (2018). Neogene Mammal sites in Molina de Aragón (Guadalajara, Spain): correlation to other karstic sites of the Iberian Chain, and their Geoheritage values. *Geoheritage*, 10: 353-362

Oliva-Urcia, B., Casas, A.M., Moussaid, B., Villalaín, J.J., El Ouardi, H., Soto, R., Torres-López, S., Román-Berdiel, T. (2016). Tectonic fabrics vs. mineralogical artifacts in AMS analysis: A case study of the Western Morocco extensional Triassic basins. *Journal of Geodynamics* 94-95, 13-33.

Osácar, C., Arenas, C., Auqué, L., Sancho, C., Pardo, G., Vázquez Úrbez, M. (2016). Discerning the interactions between environmental parameters reflected in $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ of recent fluvial tufas: Lessons from a Mediterranean climate region. *Sedimentary Geology* 345, 126-144.

Pellicer, X., Corella, P., Gutiérrez, F., Roqué, C., Linares, R., Carbonel, D., Guerrero, J., Comas, X. (2016). Sedimentological and paleohydrological characterization of Late Pleistocene and Holocene tufa mound paleolakes using trenching methods in the Spanish Pyrenees. *Sedimentology*. 63: 1786-1819.

Puértolas, E., Arenillas, I., Arz, J.A., Calvin, P., Ezquerro, L., García Vicente, C., Sánchez Moreno, E. M., Villalaín, J., Canudo, J.I. (2018). Chronostratigraphy and new vertebrate sites from the upper Maastrichtian of Huesca (Spain), and its relation with the K/Pg boundary, *Cretaceous Research*. 89: 36-59.

Pueyo Anchuela, O., Luzón, A., Pérez, A., Muñoz, A., Mayayo, M.J., Gil, H. (2016). Ground penetrating radar evaluation of the internal structure of fluvial tufa deposits (Dévanos-Añavieja system, NE Spain): an approach to different scales of heterogeneity. *Geophysical Journal International*, 206: 557-573.

Renné, P., Arenillas, I., Arz, J.A., Bermúdez, H., Vadja, V., Gilabert, V. (2018). Multi-proxy record of the Chicxulub impact at the Cretaceous/Paleogene boundary from Gorgonilla Island, Colombia. *Geology* 46(6): 547-550.

Rivero-Cuesta, L., Molina, E., Alegret, L. (2018). Eocene (Bartonian) benthic foraminifera and paleoenvironmental changes in the Western Tethys. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 503: 102-111.

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