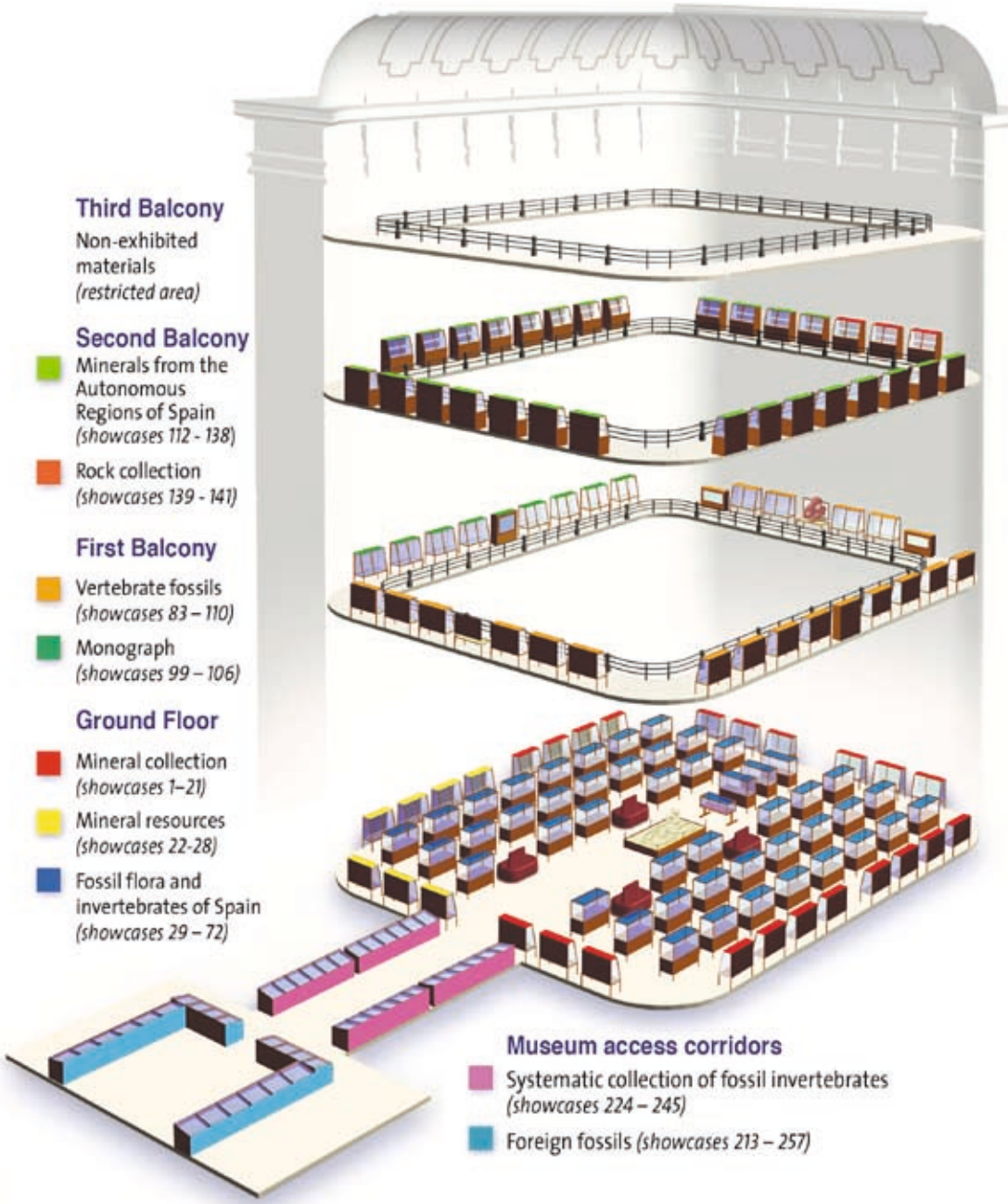
Geominero Museum

Minerals, Fossils and Rocks

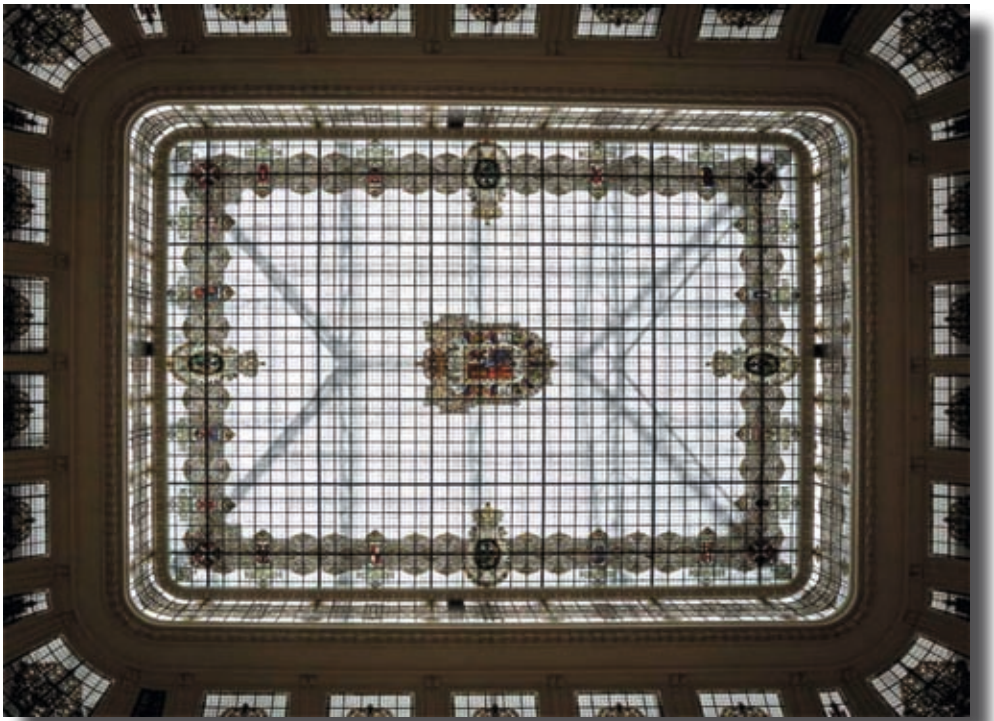

Third Balcony
Non-exhibited materials
(restricted area)
Second Balcony
Minerals from the Autonomous Regions of Spain
(showcases 112 - 138)
Rock collection
(showcases 139 - 141)
First Balcony
Vertebrate fossils
(showcases 83 – 110)
Monograph
(showcases 99 – 106)
Ground Floor
Mineral collection
(showcases 1–21)
Mineral resources
(showcases 22-28)
Fossil flora and invertebrates of Spain
(showcases 29 – 72)
Museum access corridors
Systematic collection of fossil invertebrates
(showcases 224 – 245)
Foreign fossils (showcases 213 – 257)

The building

The museum is housed in the headquarters of the Geological and Mining Institute of Spain, which was designed by Francisco Javier de Luque and built between 1921 and 1925. Listed in 1998 as part of Spain's cultural heritage, the building's grand nature combines classical elements within a generally eclectic environment. The use of wood, wrought iron and glass help provide the museum its own special atmosphere. Access to the museum is gained via a grand staircase, sculpted in white Macael (Almería) marble, crowned by a striking stained glass window. The main hall of the museum is rectangular and reaches a height of 19 m. The exhibits occupy one main floor and three perimeter balconies, which together are home to over 250 showcases. The false ceiling is a magnificent, multicoloured, horizontal, stained glass structure with vertical stained glass elements lining a half-dome,

Detail of the plastered walls and various details with plasterboard emblems and the forged iron balustrades

the work of the well known Casa Maumejean. The main motif is a great royal crest; the side motifs include four crests of the Cuerpo de Minas (Mining Engineers) flanked by the provincial crests of the 16 Jefaturas de Minas (Provincial Mining Authorities) that existed in 1925 (i.e., when the building was under construction).



Details of the internal structure of the cover

The stained glass structure

The decorative motifs are: In the vaulted zone, vegetal motifs with rolls and mirrors, except some elongated ones with white glass zones topped with a surrounding rim, the ample flat glasswork has as central motif a great royal crest on a white background, surrounded by a frame with four crests representing the Mining Engineers Corps in the centre of each side, and the crests of the sixteen Provincial Mining Authorities existing at that time. This beautiful stained glass was restored in 2001.

The collections

Forsterite. Pakistan

The aim of the Geominero Museum is to disseminate knowledge of the richness and diversity of Spain's geological and mining heritage via the permanent exhibition of representative collections of minerals, rocks and fossils. The mineral collection contains over 10,000 specimens, of which 5600 are on display. The rock collection contains over 1000 specimens, the majority of which are held in the museum's reserve. The fossil collection has more than 250,000 micro- and macropalaeontological specimens, of which over 10,000 are on permanent show.

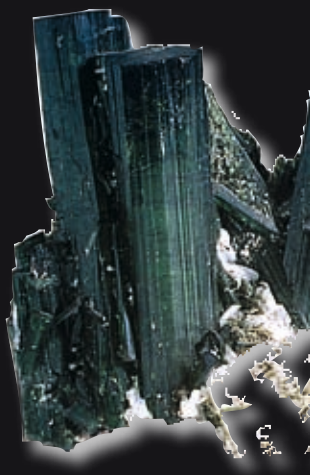
The origins of the mineral and fossil collections lie in the work of the Comisión del Mapa Geológica de España (the Spanish Geological Mapping Commission the forerunner of the present day Geological and Mining Institute of Spain), created by Queen Isabel II in 1849. During the early days of the Commission the collections were held at different places in Madrid until, in 1927, they were brought together in the main hall where they are found today. The hall itself was inaugurated by King Alfonso XIII during the XIV International Geological Congress held in Madrid in 1926.

The museum has an excellent collection of minerals and fossils from all of Spain's geological settings, as well as unique specimens of rocks and minerals from what were once Spanish territories, such as the Philippines, Cuba, and Western Sahara.

Among the most outstanding of the museum's holdings are the historic rock collection, the palaeontological and mining research collections, the Melgar mineralogical collection, and the exchange collections.

Dactylioceras. Jurassic, Germany

Elbaite (verdelite). Minas Gerais (Bra

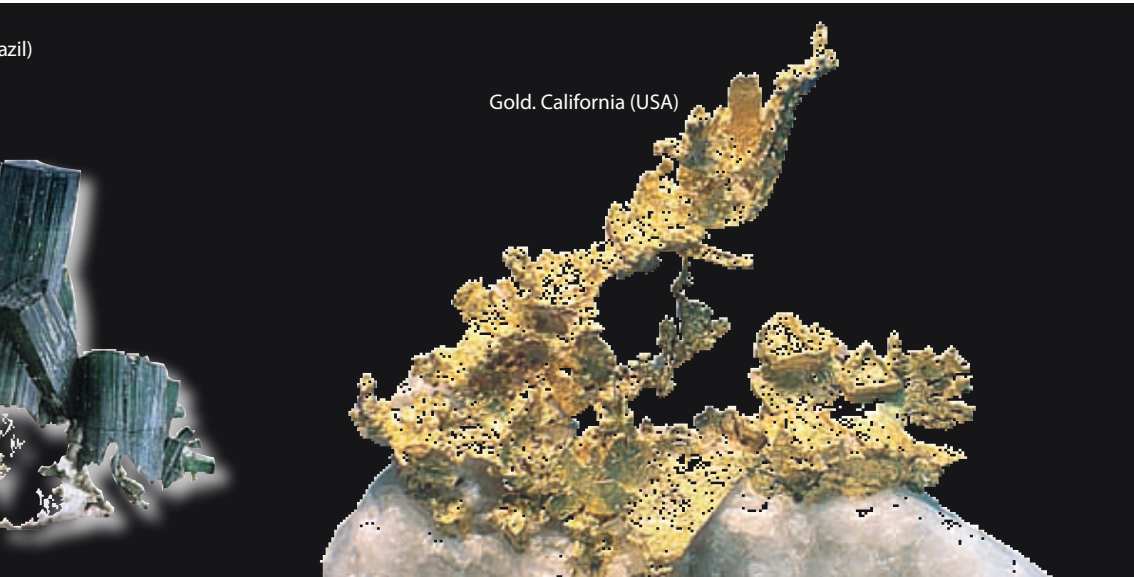


Minerals and rocks

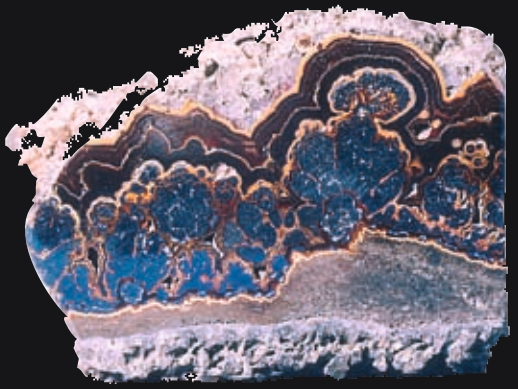
Mineral collection

This collection, housed in 21 showcases on the ground floor, includes both Spanish and foreign specimens ordered on a crystallochemical basis. The classes shown in the permanent exhibition are: native elements, sulphur salts, halides, oxides and hydroxides, nitrates, carbonates and borates, sulphates, chromates, molybdates and wolframates, phosphates, arsenates and vanadates, silicates, and organic substances. The radioactive elements are exhibited as a different group. In total, over 2000 minerals can be seen. Some of the most interesting native elements on display include gold nuggets from northwestern Spain, and a number of iron-nickel meteorites from Istlanka (Mexico), in which Widmanstätten textures can be appreciated. Among the halides, the fluorites are the most spectacular, showing a variety of colours and crystal forms. The oxide showcase contains an extraordinary specimen of rutilum from Georgia (USA), and among the carbonates a hexagonal calcite from Dalnegorks (Russia) stands out. The collection also contains gemological minerals such as beryllium (aquamarine) from Pereña (Salamanca) and crystallized pink quartz from Minas Gerais (Brazil), both of which belong to the class of the silicates. In addition, the collection of radioactive materials has the largest crystal of brennerite ever found in Spain (from Hornachuelos, Córdoba).

Vanadinite. Mibladen (Morocco)



Halite. Cardona (Barcelona, Spain)



Sphalerite. Reocín (Cantabria, Spain)

Fluorite. Villabona (Asturias, Spain)

Collection of mineral resources

This collection contains a selection of substances of mining interest. Occupying seven showcases on the ground floor, nearly 200 minerals are on display.

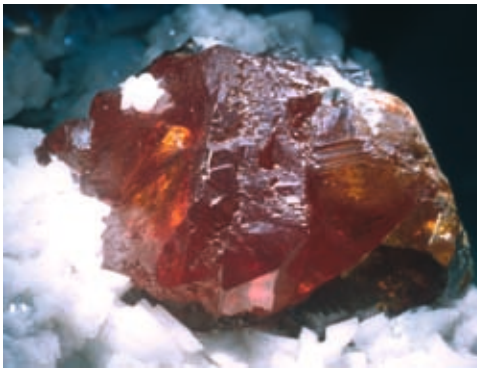
After a small introduction describing the different types of mineral resources, the first five showcases (24, 25, 26, 27 and 28) house substances used in the extraction of metals (metal ores).

These include unrefined gold from León and unrefined silver from Hiendelaencina (Guadalajara) through to the minerals from which zinc (sphalerite from Reocín, Cantabria) and tin (casiterite from Noya, La Coruña) are extracted.

Information is also provided on the most important uses of these metals, and the nations that produce them are identified. Showcase 23 houses the main industrial minerals, such as talc from Puebla de Lillo (León) and graphite from Alora (Málaga), and explains their most common uses.

Showcase 22 is devoted to major energy resources (coal, oil and uranium).

Sphalerite. Aliva (Cantabria, Spain)

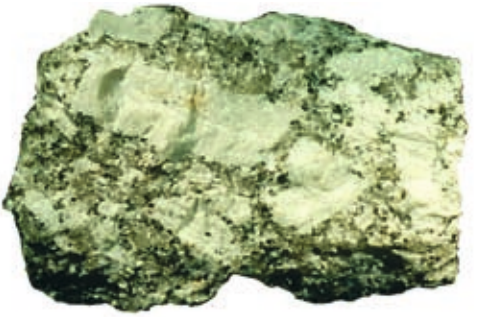


Collection of minerals from the Autonomous Regions of Spain

The 27 showcases on the second balcony are home to a collection of nearly 2000 minerals from important Spanish sites.

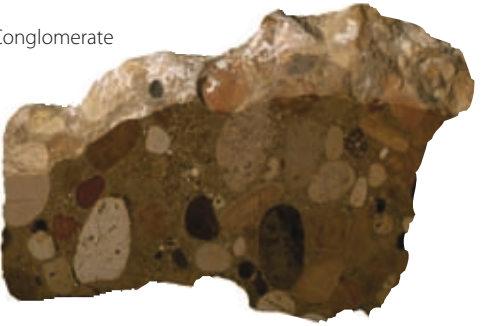
The collection is extremely rich in specimens from mines that were exhausted decades ago, such as the silver mines at Hiendalaencina (Guadalajara), from which valuable specimens of pyrargyrite and freieslebenite were collected, the phosphorus mines at Cáceres, from which abundant samples of phosphorite and apatite were gathered, and the casiterite and wolframite mines of Galicia and the zinc mines of Áliva (Cantabria), from which magnificent specimens of caramel-coloured sphalerite were obtained. Also included is a set of cinnabars from Almadén (Ciudad Real); these minerals were obtained during the heyday of this historic mining site.

The collection also boasts a large quantity of minerals not associated with traditional mining but which are very much appreciated by collectors, such as quartz (*Jacinto de Compostela*) from Chella (Valencia), pyrite from Navajún (La Rioja), and marcasites from Reocín (Cantabria). The minerals in the pegmatites from La Cabrera (Madrid) are the finest ever collected in this region.



Granite

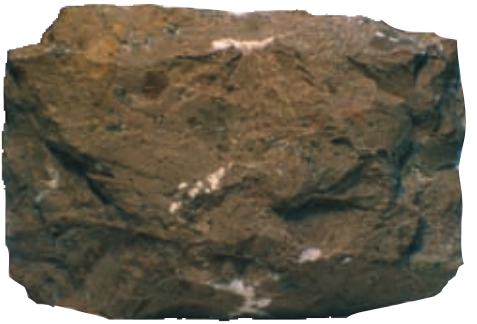
Conglomerate



Basalt

Rock collection

This collection is found on the second balcony where it occupies three showcases. It represents the three main types of rock: sedimentary, metamorphic and igneous. Over 100 specimens of the most common rocks are on display.



Recristallized limestone

Fossils

Fossils of Spanish flora and invertebrates

This collection displays the palaeontological richness of Spain in chronostratigraphic order. This is the only exhibit of its kind in the country, and provides an idea of the great palaeobiological diversity of Spain from the Upper Proterozoic to the Pliocene. The collection, with 7735 specimens on display, is housed in 44 showcases. Among the most outstanding are the trilobites and their traces in rocks from the Ordovician Period (from the *Montes de Toledo*), the Devonian echinoderms, the fossil plants of the Carboniferous Period (from the Cantabrian Mountains), the Mesozoic cephalopods from the *Cordillera Ibérica*, the Cretaceous corals from the Pyrenees, the Palaeogene ichnofossils from the Cantabrian flysch, the collection of Miocene plants from different Spanish river basins, and the Pliocene marine molluscs of Almería and Málaga.

Homeoplanulites. Jurassic, Oliete (Teruel, Spain)

Strombus. Neogene, Roquetas de Mar (Almería, Spain)

Isabelinia. Ordovician, Calzada de Calatrava (Ciudad Real, Spain)

Lepidodendron. Carboniferous, Guardo (Palencia, Spain)

Collection of fossil vertebrates

This collection can be found on the first balcony, where it occupies 20 showcases. Over 2000 specimens are on display, organised on an evolutionary basis from fish to the fossilised remains of humans and their stone artefacts. There is also a diorama explaining the formation of coal in a lake environment. Two other dioramas recreate the terrestrial ecosystems that were home to the Upper Cretaceous reptiles of La Rioja (Spain) and North America.

A replica of the most complete skull of *Tyrannosaurus rex* ever found (from the Upper Cretaceous of South Dakota, USA) is a reference point for finding the fossil vertebrate collection. Some of the most interesting exhibits are the shark teeth from the Pliocene of Málaga and Huelva, the continental fish from the Tertiary of Teruel and Albacete, the frogs and little-known amphibians from the Miocene of Teruel and Castellón, the reptile footprints from the Triassic of Guadalajara, the crocodiles from the Oligocene of Lérida, the mastodons of the Tertiary basins of the Rivers Duero and Tagus, the skeleton of *Myotragus* (an endemic bovid of the Balearic islands), the collection of Plio-quaternary mammals, the collection of hominoid and hominid replicas, and the replica of *Iberospondylus*, the most ancient amphibian ever found in the Iberian Peninsula.

Rana. Miocene, Libros (Teruel, Spain)

Leptobos. Pliocene, Villarroya (La Rioja, Spain)

Megantereon. Pliocene, Villarroya (La Rioja, Spain)

Collection of foreign fossils

This collection has more than 3000 specimens; over 1000 are on display in the 23 showcases lining the staircase. The collection is of historic interest since it was gathered in the second half of the XIX and the first half of the XX centuries. Its contents come from a number of classic sites, and from others that have now disappeared.

Among the most outstanding pieces are the giant trilobites of the Ordovician of Portugal, the crinoids from the Silurian of Morocco, the collection of Devonian corals from the old colony of Spanish Sahara, the Permian fish from Mansfeld (Germany), the collection of arthropods from Solnhofen (Germany), and the collection of marine invertebrates from the Tertiary basin of Paris (France).

Priscacara. Eocene, Wyoming (USA)

Archaeocidaris. Carboniferous, Texas (USA)

Mesosaurus. Permian, Brazil

Systematic collection of fossil invertebrates

This collection occupies 22 showcases lining the museum's main access corridor. These contain the main groups of fossil invertebrates arranged on an evolutionary basis, with special attention paid to their most distinctive morphological features. Nearly 1000 specimens are on display, including sponges, archaeocytes, cnidarians, arthropods, molluscs, bryozoans, brachiopods, echinoderms and graptolites. There is also a showcase with important examples of certain fossilization processes (pyritization, silicification, and the formation of moulds etc.).

Of special interest are the crustaceans of the Eocene of Huesca, the Silurian chelicerates, the collection of brachiopods, the Tertiary echinoderms, and the collection of Ordovician and Silurian graptolites.

Modocia. Cambrian, Utah (USA)

Archaeogerion. Miocene, La Pampa (Argentina)

Campanile. Eocene, France

Beryl (aquamarine). Gilgit (Pakistan)

Insect in Dominican amber. Tertiary

Other exhibits and collections

The ground floor of the museum houses three showcases (72 – 74) containing samples of fossils and minerals considered to be of special interest due to their excellent state of preservation. Among the minerals are gypsum crystals from Fuentes de Ebro (Zaragoza), a magnificent specimen of pyrite from Lucainena de las Torres (Almería), a deep red crystal of elbaite (rubelite) from Alto Lingonha (Mozambique), and finally the largest crystal of vivianite ever extracted at La Unión (Murcia). Standing out among the fossils is the collection of trilobites from a number of famous sites, and a Miocene salamander (from Ribesalbes, Castellón) showing very well preserved skeletal structures and impressions of the soft tissues. The central area of the ground floor is occupied by a showcase containing an exceptional sample of pyrite from the world's most important site for this mineral (Navajún, La Rioja), and by a large scale montage reproducing the excavation of a mastodon (*Anancus arvernensis*) at the Pliocene site of Las Higueruelas (Alcolea de Calatrava, Ciudad Real). In the corners of the ground floor there are four 'theme showcases' (79-82) devoted to *Ornamental Minerals and Gems, Amber and Fossils*, the *Physical Properties of Minerals*, and *Crystallographic Systems*. On the ground floor there is a monographic showcase containing several specimens of smoked quartz with laumontite, all over 10 cm in length, that were obtained from one of the largest miarolitic cavities ever seen in granite from La Cabrera (Madrid). Finally, this collection has a replica of the most complete skull of the mastodon *Gomphotherium angustidens* ever found in Spain (showcase 70; made found at Cerámicas Mirasierra); from the Miocene of Madrid.

Visiting rules

Entry to the museum is free. Groups should arrange the time of their visits by telephone. Guides are available for the preparation of teaching visits (these are free upon request). The museum has an excellent video library which can be made available to groups upon request. Summer workshops are available to children.

Guided visits

Tour guides who can accompany and help groups are on call from Monday to Friday. These volunteers are made available through the *Voluntarios Culturales Mayores* programme (managed by the *Confederación Española de Aulas de la Tercera Edad*); their function is to guide visitors around the cathedrals and museums of Spain.

How to get to the museum

Buses: Lines 3, 12, 37, 45 and 149.
Metro: Ríos Rosas
(line 1, look for the salida impares exit)

Opening hours

Monday to Sunday and holidays, open from 9.00 h to 14.00 h. The museum closes on the 24th, 25th and 31st of December, and on the 1st and 6th of January.

Geominero Museum
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28003 Madrid

Tels: 913 495 759 for arranging visits
913 495 959 for the museum secretary

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