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## Association of Applied Geochemists

### INVITATION TO EXPLORE OUR ENVIRONMENT



Jorge Loredo

The 23<sup>rd</sup> International Applied Geochemistry Symposium (IAGS) will be held in Oviedo, Spain, from June 14 to 19, 2007. With its 215,664 inhabitants, Oviedo is the capital of Asturias in northern Spain. The symposium will take place in the Conference Hall of the City, in the heart of Oviedo and within walking distance of hotels and amenities.

The organizing committee has planned a varied program on applied geochemistry, covering the latest advances in geochemical techniques for mineral exploration and the environment. Pre- and post-symposium field trips will combine technical and

tourist visits to Spain and Portugal. A full slate of workshops will take place on the weekend before the symposium (June 16 and 17). An exciting social and cultural program for participants and accompanying guests includes several one-day tours to places of interest in the region.

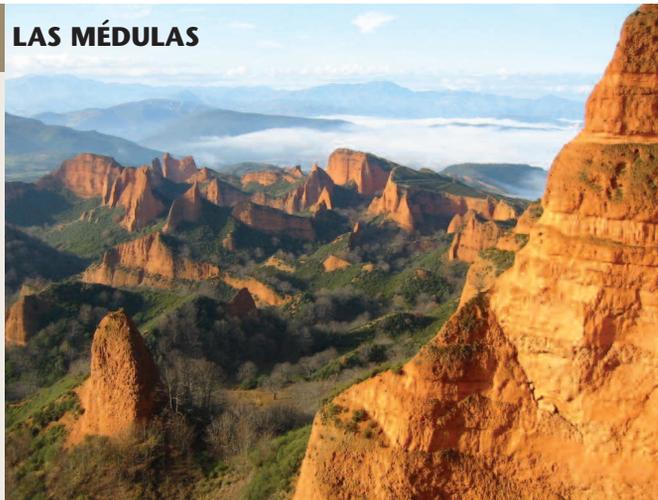
Twelve special sessions are planned on themes ranging from the health-related issue of metals in the environment to new research in surface and lithochemical exploration methodology. Four short courses, given by recognized experts, and four field excursions are also planned.

Short Course 1	Lithochemical exploration in Mineral Exploration: Principles and Practice of Molar Element Ratio Analysis (in English) Presenter: Dr. Clifford R. Stanley
Short Course 2	Mine Water Geochemistry (in English) Presenter: Dr. Paul Younger
Short Course 3	Urban Geochemistry (in Spanish) Presenter: Dr. Eduardo de Miguel
Short Course 4	A Ramble through the Regolith (in English) Presenter: Dr. Ian Robertson
Excursion 1	Almaden (Hg), Rio Tinto (Cu), Las Cruces (Cu), Agua Blanca (Ni-Cu), Las Médulas (Au)
Excursion 2	Almaden (Hg), Rodalquilar (Au), La Unión (Pb)
Excursion 3	Begega (Au), As Pontes (coal), Las Médulas (Au)
Excursion 4	Reocín (Zn-Pb), Bilbao (Fe)

On behalf of the organizing committee and the Association of Applied Geochemists, it gives me great pleasure to invite you to participate in the 23<sup>rd</sup> IAGS and I look forward to seeing you in Oviedo.

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### LAS MÉDULAS



Las Médulas is one of UNESCO's 730 World Heritage Sites (WHS) and one of 37 WHS in Spain; Spain has the most WHS of any country in the world. Accepted in 1997 into the WHS list, Las Médulas is a spectacularly preserved alluvial gold mining area (2000 hectares) with more than 50 archaeological sites recorded. Wonderful landscape and architecture typify the region, and numerous museums have information on Las Médulas. Las Médulas is one of the stops on two of the field excursions and is considered a must-see for geologists in Spain. There is abundant information in Spanish on various websites and links through UNESCO's WHS list.

During the reign of Augustus, the Roman Empire went to a gold standard (7.8 gram gold coin, the aureus), thus increasing the demand for the metal. The Asturs, the last peoples to be enslaved by the Romans in Spain and Portugal, were forced to mine in various parts of their region. Las Médulas was probably the largest gold-mining area in the Roman Empire for almost 200 years, ending in the early part of the 3<sup>rd</sup> century AD; it contributed over 5% of the wealth of the Roman treasury.

The alluvial gold deposits are hosted in the conglomeratic parts of the Miocene red fluvial (or glacial-fluvial) deposits; gold-bearing quartz, dust, platelets, and nuggets were described. Obviously, these deposits formed from the intense weathering and subsequent erosion of the Hercynian gold deposits, which are famous in north-western Spain. In fact exploration in the historical areas of mining by the Asturs during Roman times has led to more recent gold discoveries in the region.

The geographer and naturalist, Pliny the Elder (who died near Pompeii in the 79 AD eruption of Vesuvius and whose nephew, Pliny the Younger, recorded the "Plinian" eruptions west of Vesuvius) noted in his book *Naturalis Historia* that this region supplied over 6500 kg of gold per year. In the same book, Pliny detailed the mining methods of the region, which included building huge canals (400 km of canals) from the mountain tops and rerouting rivers (River Oza) in order to wash the mined material into the panning fields near the town of Las Médulas, at the base of the mountain. Between 100 and 230 million cubic meters were mined from the area, and tailing heaps typify the lower regions. Interestingly, this was one of the main arguments against making this a WHS, because it was argued that it represented the ecological destruction of the region. Rather, what is left is a snapshot of the region's mining heritage and economic endowment. Earlier estimates of gold grade indicated about 1 ppm gold per tonne, with up to 10 ppm (probably locally); recent estimates are much lower, averaging about 50 mg/m<sup>3</sup> (several hundred ppb). Therefore the amount of gold extracted is probably much lower than once thought. Mining ended abruptly as a result of the problems in the Roman Empire and the change from the gold currency standard.