

## Report on the UNESCO-SEG Course on Metallogeny Mendoza, Argentina – August 17-28, 2004

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The UNESCO-SEG Latin American Course on Metallogeny was held in Mendoza, Argentina, August 17–28, 2004. About 60 geologists attended, with representatives of universities, research institutes, geological surveys, and mining companies from Argentina, Bolivia, Chile, Mexico, and Peru. The course was organized by the CRICYT-CONICET and obtained additional support from SGA, Instituto Geológico y Minero de España (IGME), ETH Zürich, University of Alberta, Fundación CRICYT, Placer Dome, IAMGOLD, Rio Tinto, and Piedra Grande.

The course is the only one of its kind in Latin America as it is taught mostly in Spanish. Its objective is to provide up-to-date information on the geology and geochemistry of ore deposits to postgraduate students, university professors, and professionals dealing with ore deposits. The course is held annually and is itinerant throughout the continent.

This year, the SEG-UNESCO course had Fernando Tornos (IGME) as international coordinator and Florencia Márquez-Zavalía (CONICET) and Nivaldo Rojas (consultant) as national coordinators. A week of classes was followed by another week of field visits. Lectures were given by Fernando Tornos (general introduction and geochemistry

of ore deposits), Francisco Velasco (stable isotope geochemistry and fluid inclusions), Jeremy Richards (radiogenic isotopes and geodynamic and magmatic setting of porphyry copper systems), Chris Heinrich (fluid evolution in porphyry and epithermal systems), Antonio Arribas (epithermal deposits), Jose Perelló (case studies on porphyry copper exploration), Eduardo Zappettini (metallogenesis of Argentina), Nivaldo Rojas (the Agua Rica deposit), Milka de Brodtkorb (the Famatina deposit), and Florencia Márquez-Zavalía (textures in epithermal systems). Classes were complemented with practical seminars, including problems on geochemistry, stable isotopes, fluid inclusions, and radiogenic isotopes.

I would like to note the “tools of the trade” employed by different speakers to make their classes more popular; while Jeremy Richards gave his classes in Spanish (not “Spanglish”) with no shortage of effort, Chris Heinrich “sweetened” the audience by supersaturating it with Swiss chocolate—both tricks worked! Above all, over the two weeks of the course/field trip, Florencia was an outstanding organizer, coordinator, administrator, negotiator, accountant, on-call mineralogist, tourist guide, and even—some would

say—babysitter.

The class component was complemented with a >2,000-mile trip, often along terrible roads, to visit some of the most significant porphyry copper and precious-metal epithermal deposits in the provinces of Mendoza, San Juan, La Rioja, and Catamarca. The long, long hours in the bus were approached in different ways by different people. Some would strenuously dedicate themselves to getting as much sleep as possible. Most, by contrast, enjoyed the ever-present Argentine mate and kept themselves busy singing (specially Bolivian, Swiss, and Spanish flamenco folklore) or dancing tango and conga in the narrow bus corridor. The “sleepers” had a good excuse, since the very busy trip schedule was fully honored, often at the expense of getting no more than 4 or 5 hours of sleep every night. To the amazement of all, group spirits only improved as sleep deprivation increased.

The field trip started with a visit to the Paramillo porphyry prospect, located about halfway between Mendoza and Santiago de Chile, followed by the Paleozoic age Casposo high-grade, low-sulfidation epithermal deposit. The day finished with a late *asado* in the town of Calingasta. On

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Course participants gather for a group photo after the first week of theoretical, classroom work.

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Instructors pose at the Agua Rica mine: (left to right) Francisco Velasco, Fernando Tornos, Nivaldo Rojas, Antonio Arribas, Florencia Marquez-Zavalía, and Christoph Heinrich.

Day 2, Barrick's Bob Laidlaw gave a detailed overview of the Veladero project at a hotel in San Juan, together with a core/sample exhibit and a great lunch. From Chilecito, we headed on Day 3 to the remote La Mejicana district, up at over 14,000 feet in the spectacular Sierra de Famatina. The La Mejicana system contains a remarkable section of a porphyry to high-sulfidation system between 3,100 and 4,500 m

elevation. Although the deposit was last mined many decades ago, we were able to safely enter underground workings where alunite-enargite banded veins can be sampled. Down in the town of Famatina, local authorities treated us to a good sampling of local walnuts, a better known local product than famatinite, the Sb analog of enargite/luzonite.

Days 4 and 5 were spent at the Farallón Negro district, first visiting the

rhodonite-carbonate-quartz-gold epithermal veins of the Farallón Negro deposit, then the world-class Bajo de la Alumbraera porphyry Cu-Au deposit. Mine staff and consultants at Bajo de la Alumbraera went through a very well received overview of the open pit and a complete collection of representative drill core. The last working day of the trip was devoted to the Agua Rica deposit, another huge Cu-Au porphyry system extensively explored by various companies. Perhaps even more impressive than the breccias in the deposit, Agua Rica presents some of the most challenging topography ever witnessed in any deposit.

On behalf of SEG and UNESCO, we would like to acknowledge all the individuals, mining companies, and other contributors that made us all very welcome in Argentina and made possible these rewarding visits: SEGEMAR (Paramillo), Intrepid Minerals Corporation (Casposo), Barrick (Veladero), YMAD (Farallón Negro), Minera Alumbraera (Bajo de la Alumbraera), and Northern Orion (Agua Rica), among others. For those interested, more information on this SEG-UNESCO course can be found at <[www.cricyt.edu.ar/seg-unesco/metalogenia2004.html](http://www.cricyt.edu.ar/seg-unesco/metalogenia2004.html)>. 

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