



# AGS NEWSLETTER

ARIZONA GEOLOGICAL SOCIETY, INC., TUCSON, ARIZONA

January 2010

## January 5, 2010 DINNER MEETING

### Magmatic PGE Deposits Associated with Mafic and Ultramafic Rocks

Michael L. Zientek, U.S. Geological Survey

The presentation will provide an overview of the major types of magmatic PGE deposits associated with mafic and ultramafic rocks. The different styles of magmatic ore deposits will be described, emphasizing the global-scale processes and secular variations that control their distribution, and the deposit models that summarize deposit characteristics and grade and tonnage variation. Ore deposit

types to be discussed include: (1) Cu-Ni-PGE deposits in sill complexes associated with large igneous provinces, (2) reef-type PGE deposits in layered intrusions, and (3) contact-type Cu-Ni-PGE deposits in layered intrusions. Case studies will focus on the magmatic ore deposit types most important for world supply of PGE.

### Recent Job Postings

Position	Agency/Company	Note/Job ID	Date Posted	Date Expires
Project Coordinator, Geothermal Data System	Arizona Geological Survey	See Note 1.	Dec. 17, 2009	Jan. 6, 2010
Research Geologist GS12/13, Reston, VA, Permanent	U.S. Geological Survey, Energy Resources	See Note 2/ 85091614	Dec. 16, 2009	Feb. 16, 2010
Research Geologist GS12/13, Reston, VA, Permanent	U.S. Geological Survey, Energy Resources	See Note 2/ 85091563	Dec. 16, 2009	Feb. 16, 2010
Research Geologist GS12/13, Reston, VA, Term appointment	U.S. Geological Survey	See Note 2/ 85092217	Dec. 16, 2009	Feb. 16, 2010

1. Go to <https://secure.azstatejobs.gov> and enter "geothermal" into the search box.

2. Go to <http://jobsearch.usajobs.gov>, click Status and enter Job ID.

### December Dinner Meeting — Sheraton Four Points, Conference Center

1900 E. Speedway Blvd., Tucson, AZ

(DINNER SALAD, NO-SALT, AND VEGETARIAN/VEGAN MEALS ARE AVAILABLE UPON REQUEST.)

RESERVATIONS ARE REQUIRED. PLEASE CALL 520-663-5295 BEFORE JANUARY 1, 2010, OR MAKE YOUR RESERVATION ON LINE AT THE AGS WEB SITE UNTIL MIDNIGHT, JANUARY 3, 2010.

Cash Bar @ 6 pm

Dinner @ 7 pm

Talk @ 8 pm

Cost: Members \$24, Guests \$27, Students \$10

# A NNOUNCEMENTS

## 2010 AGS CALENDAR

02/02/10

### AGS DINNER MEETING

**Leslye Obiora**, UA Law Professor, formerly Minister of Solid Minerals in Nigeria: *The challenges of mining and mineral exploration in Africa*

03/02/10

### AGS DINNER MEETING

**Wayne Ranney**, *Ancient Landscapes of the American Southwest*

March 27 - April 11, 2010

### AGS SPRING 2010 FIELD TRIP \*

MOROCCO (via Frankfurt am Main, Germany)

Leader: Doug Shakel

**\*Passport will be required.**

04/06/10

### AGS DINNER MEETING

**Rachelle Wagner**, NAU, *Miocene fault and basin analysis along the Boulevard and Dry Wash faults, northern Frenchman Mountain, Lake Mead domain, NV*

09/07/10

### AGS DINNER MEETING

**Marcia McNutt**, Director, USGS, *Topic to be announced*

11/02/10

### AGS DINNER MEETING

**Peter Megaw**, *Discovery of the Fresnillo West Mining District, Mexico*

12/07/10

### AGS DINNER MEETING

**Susan Cummins Miller**, Author, *Clean as Bone, Firm as Stone: Earth Science and Place in the Frankie MacFarlane Mysteries*

## MOROCCO 2010

### Update for those interested in chasing fossils in Morocco with the Arizona Geological Society...

27 March thru 11 April in Europe and Africa !

Morocco arrangements are made and Frankfurt hotel rates secured. The group will assemble in Frankfurt am Main, Germany the evening of 27 March 2010, and from Frankfurt will depart for Casablanca, Morocco on 29 March. The return from Morocco will have the group again in Frankfurt on the evening of 10 April 2010. Method and time of arrival in and departure from Frankfurt is up to individuals in the group, and is not included in the tour price.

While it will likely not affect the trip directly in any remarkable way, please note the timing includes Easter Sunday weekend.

Germany could be cold and rainy, but the weather in Morocco is much like Arizona at that time of year – possible rain and chilly in the north, more likely sunny and dry south of the Atlas Mountains (The mountains get up to more than 16,000 feet and there WILL be snow!) Most of the trip will be south of the Atlas Mountains, on the northern fringes of the Sahara Desert. Cultural experiences will include visits and overnight stays in Marrakech and Fez.

THE TRIP IS NOT DEFINITE until there are eight paid participants. If you have paid a deposit already, you will be notified when the minimum number is met and the trip is a “go.” If you want to go on the trip, please SEND MONEY NOW.

Total cost for the round trip Germany – Morocco AGS trip is \$3,100 per person, if paid in full before 10 January 2010 and \$3,300 if paid later. \$500 per person will reserve a spot .

Please send your trip form (available from the AGS web site) and deposit to ARIZONA GEOLOGICAL SOCIETY, P.O. Box 40952, Tucson, AZ 85717. Also, it will be necessary to drop an E-mail to Doug Shakel, Field Trip Leader, at dshakel@dakotacom.net, to let him know you mailed your deposit. [The mail box is checked by the AGS Treasurer, not by the Field Trip Leader, and as we all know everything slows to a crawl over the holidays.]

# Two nights and a day and a half in Mexico's El Pinacate volcanic field...

by Doug Shakel, AGS VP of Field Trips

Six intrepid campers joined trip leader Dan Lynch and AGS VP for field trips Doug Shakel on Friday, 4 December for a journey to northwestern Sonora to explore and examine features of the Pinacate volcanic field. Woody Brooks went down early in the morning with Dan who was eager to get back to a place he clearly loves, and where he spent many days of mapping and other field work in the late 1970's for his U. of Arizona Ph.D. Dissertation.

Mid-afternoon Doug gathered up the remaining five trip registrants for a late drive into the volcanic field, the last hour and a half of which was in the dark! Doug was greatly relieved but especially pleased with himself after actually finding his way into the heart of the volcanic field at the Tecolote campsite, having not been in there by the northern route in more than 5 years!

**At 7:05 pm, with sharp-eyed help from the passengers and rather vague instructions from the driver, the afternoon van finally found the correct turn-off from Mexico highway 2 into the “Reserva de La Biosfera,” as confirmed by the pair of signs at the right.**



Shortly after arrival of the second group, Dan was soon preparing a spaghetti dinner for all, complete with salad. Several of the trip participants had never been to the Pinacates at all, and were quite eager to see what the place might look like in the daylight. But after the lanterns were doused after dinner and before the bright moon rose, we were all treated to as splendid a starry night sky as might be possible at that altitude and latitude.

At dawn Saturday morning Dan was at it once again, cooking breakfast for everyone! Soon thereafter, he led our group up the trail to the top of the cinder cone Mayo, just north of our campsite. Dan had named Cono Mayo after the venerable U. of A. structural geology professor of the mid-twentieth century – Evans B. Mayo (although it is not certain that he'd ever actually been here!)

From the top of Volcán Mayo there was a fine view of Cono Tecolote to the south, with its surrounding six lava flows that so fascinated Dan when he did his field work here.

After returning from the climb up Cono Mayo, we packed everyone into the rental van and headed around several of the flows from Cono Tecolote to get to Crater Elegante, more or less the “signature piece” of the Pinacate volcanic field. Did Padre Kino name this distinctive feature? He certainly must have seen it.

About a mile in diameter and nearly 1,000 feet deep, the steep sides of Crater Elegante make for a close mimic of Meteor Crater in northern Arizona. There are nine of these maar craters in the Pinacate volcanic field, but Elegante is the most visited and the most photographed. Thought to have formed from repeated phreatic (steam) eruptions, sometime after its eruption a small lake formed within the crater; topset and foreset beds around the margins of that lake are evident in the lower third of the crater, and tiny gastropod shells have been recovered from some of those beds.



**View of Cono Tecolote to the south of Tecolote campground. (Note vehicles for scale!)**



**The high country of the Sierra Santa Clara can be seen off towards the southwest.**



**Crater Elegante, as viewed from its north rim.**

**Field Trip Leader, Dan Lynch, points out an error in the signage on the rim of Crater Elegante.**



Maar craters are the only volcanic landforms that yield rim to terrain proportions, and ratios of depth and width parameters comparable to explosion/meteorite impact craters. Hence the great interest in them when it was evident we would soon have men walking on the moon in the late 1960s–early 1970s. Long story made short—the Apollo astronauts trained here.

After a brief walk along the northwestern rim of Crater Elegante and a descent of several hundred feet into the crater below its rim, the group returned to the vehicle and headed off to Cerro Colorado.

Cerro Colorado is another maar crater, albeit of a very different aspect, mostly due to a large proportion of its ejecta having been deposited on its south rim, and generally lacking in dark volcanic materials. Hence its name is based on its most distinctive feature—Cerro Colorado, or “red hill.”



**At left is the cross-sectioned cinder cone now exposed, having been blasted in half by the eruption of Crater Elegante.**

**Camp site, Saturday morning.**





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AGS books and maps are sold at the monthly dinner meeting and by the Arizona Geological Survey. Visit the AZGS website www.azgs.state.az.us and click on Non-AZGS Publications



*You can now update personal information on line as you move, change jobs, or change your e-mail address. Visit [www.arizonageologicalsoc.org](http://www.arizonageologicalsoc.org) and log in with your email address to get your password.*

**2010 AGS MEMBERSHIP APPLICATION OR RENEWAL FORM**

Please mail check with membership form to: Arizona Geological Society, P.O. Box 40952, Tucson, AZ 85717. Dues (circle one): 1 year: \$20; 2 years: \$35; 3 years: \$50. (Full-time students receive free membership. The newsletter is by e-mail only, and a membership application form must be returned to AGS annually to remain on the membership list.)

Name: \_\_\_\_\_

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Please send the newsletter by e-mail only  by regular mail only  by e-mail AND regular mail

If registered geologist or engineer, indicate registration number and state: \_\_\_\_\_

If AIPG member, indicate registration number: \_\_\_\_\_ Please indicate by circling whether your address, email, or phone number should be withheld from the AGS membership directory or web site.

Enclosed is a \_\_\_\_\_ tax-deductible contribution to the J. Harold Courtright Scholarship Fund.