

# Inland Geological Society

Aug 2008

Newsletter of the Inland Geological Society

Volume 24 No. 8

**This Meeting:**  
**Wednesday,**  
**August 6th**

**Time:**  
**Social: 6:00pm**  
**Dinner: 6:30pm**  
**Lecture: 7:00pm**

**Location:**  
**LSA Associates**  
**1500 Iowa Ave**  
**Suite 200**  
**Riverside, CA**  
**92507**  
**(Map on Pg.4)**

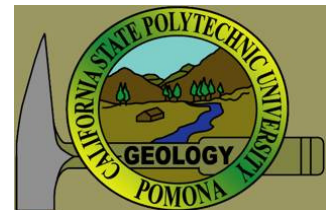
**Coming to**  
**Dinner?**  
**Please RSVP:**  
**By Friday 8/1**  
**(951) 782-3295**  
**dlass@**  
**waterboards.ca.gov**

## **In this Issue:**

- August Speaker—Dr John Nourse ..... 1-2
- Upcoming Events/IGS Meeting Schedule..... 3
- Current IGS Officers ..... 4
- **LSA MEETING LOCATION MAP** ..... 4

## **August Speaker:**

**Dr. Jon Nourse, PhD**  
**Cal Poly, Pomona**



## **Precious and Base Metals Exploration Meets Structural Geology and Tectonics along the Sonora Mineral Belt, Northwestern Mexico**

### Abstract

Precious and base-metals exploration has accelerated within the Sonora mineral belt of northwestern Mexico since the onset of the commodities boom in 2004. Host of Mexico's largest gold mine (La Herradura) and the world-class Cananea porphyry copper deposit, this northwest-trending zone of complexly faulted basement has yielded countless new metal discoveries in recent years. In addition to the good access / infrastructure and a political climate that encourages exploration, mining geologists recognize that Sonora embodies all the necessary elements for economic mineral deposits: structural preparation, multiple intrusions or thermal events, concentration of metals by mineralizing fluids, and remobilization of metals along low-angle structures. Knowledge of the local geologic history and geometry of crosscutting structures is crucial for targeting drill holes in areas where ore bodies may be truncated by and/or disseminated along low-angle faults. In this talk I will describe recent work on two properties in Sonora where structural mapping of large tracts of ground surrounding old mine workings has yielded new areas for focused exploration.

On the 6564 hectare Colibri Property northwest of Caborca, volcanic and sedimentary strata of the Jurassic arc host numerous underground mine workings exploited for gold since Spanish colonial times. In the vicinity of San Francisco and Juarez mines, previous exploration targeted a network of WNW and NE-striking quartz veins probably originally

*Continued on Page 2*

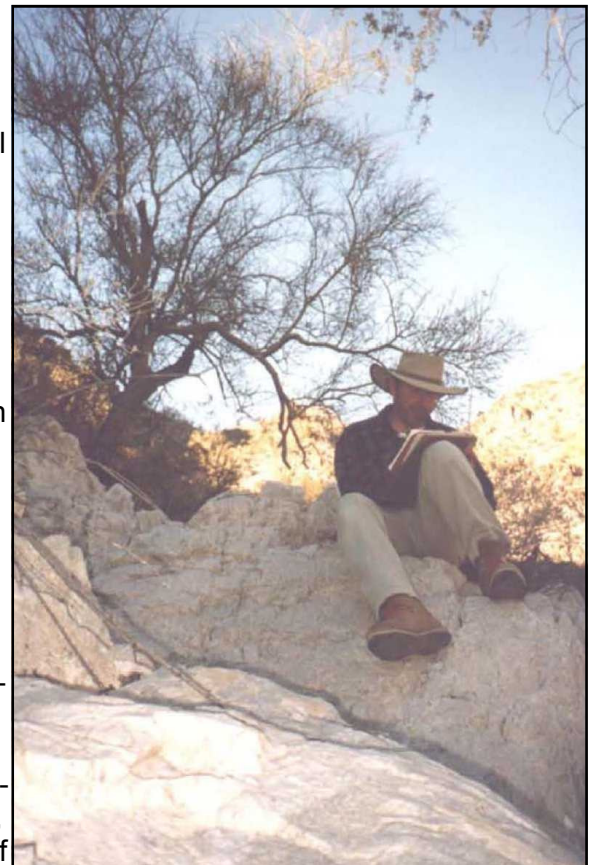
emplaced along conjugate faults and fractures of the Mojave-Sonora megashear, a Late Jurassic transform plate boundary. Closer inspection reveals that veins with the highest gold concentrations (1 to 25 grams/ton) have been reactivated as reverse-slip and oblique-slip shear zones. Primary gold concentration appears to have been associated with intrusion of diorite during NE-SW directed Laramide crustal shortening. A second generation of Miocene(?) low-angle normal faults (detachment faults) crosscuts the high-grade vein network. In places, gold has been remobilized and disseminated along the undulating detachment surface, providing potential targets for bulk-tonnage mining. Ongoing drilling and IP-Resistivity surveys seek to delineate near-surface occurrences of disseminated gold with broad areal extent.

The Leon Property is located southwest of El Creston molybdenum deposit in central Sonora. This property consists of 6000 hectares of claims that cover several old mine districts currently under option to Colibri Resource Corporation (TSX-CBI). Spatial distribution of rocks, structures and metals suggests that the Leon Property represents at least part of the El Creston porphyry system, exhumed in the lower plate of a north-east-dipping, mid-Tertiary detachment fault system. The El Creston ore body (mapped and drilled by AMAX Exploration, Inc.; Leon and Miller, 1981) is hypothesized to have been displaced northeastward ~3 to 5 km from ground exposed on the Leon Property. Widespread molybdenum-copper-zinc mineralization occurs in footwall rocks and soils of the Leon Property directly adjacent to mapped detachment fault(s). Soil assays exceed 200 ppm molybdenum and 1000 ppm copper and chip samples from quartz veins and altered granodiorite host rock average 580 ppm molybdenum over an area greater than 2 square kilometers. Several kilometers WSW are vein systems with gold-silver-lead-zinc mineralization, believed to be the distal zone of mineralization associated with the same porphyry system. Significant vein networks contain gold (1 to 20 g/ton Au) and silver (50 to 1340 ppm Ag), plus lead, zinc and copper, within and nearby historical mine camps known as Las Amarillas, El Tramado and La Bellota. Exploration and diamond core drilling on the Leon Property is ongoing.

This is an exciting time for mining in Sonora, with exploration endeavors and mine development expanding each year. Technical employment opportunities abound for geologists, drillers, engineers and hydrogeologists, as well as their assistants.

#### **Biography:**

Jon Nourse holds a BS degree in Geological Engineering from Colorado School of Mines (1983) and MS and PhD degrees in Geology from Caltech (1895 and 1989). He has conducted geological field research in Sonora, Mexico since 1985, beginning with a doctoral dissertation on the geology and structure of the Magdalena metamorphic core complex. Nourse has written several articles describing Tertiary extension, Laramide contraction, and Proterozoic basement geology in Sonora, and is co-editor of GSA Special Paper #393 on the Mojave-Sonora megashear. Since 1999 he has applied his expertise in field geology and tectonics to the search for structurally-controlled gold, silver, copper, and molybdenum deposits within the Sonora mineral belt. Nourse has taught geology full-time at Cal Poly Pomona for the past nineteen years, where he and students utilize the San Gabriel Mountains for locally accessible research projects. He has published extensively on the geology and hydrogeology of the eastern San Gabriel Mountains. Since 2005, Nourse has served as Vice President of Exploration for Colibri Resource Corporation, a Canadian junior-venture mining company.



*Geological mapping in the el Desierto Altos, northwestern Sonora, Mexico*  
Source: <http://geology.csupomona.edu/janourse/>

Dr. Jon Nourse  
Department of Geological Sciences  
California State Polytechnic University  
3801 W. Temple Ave., Pomona, CA 91768  
Phone: (909) 869-3460  
[janourse@csupomona.edu](mailto:janourse@csupomona.edu)

## Upcoming Meetings/Events

### Rock & Gem Shows—Various locaitons

Various rock and mineral shows will be throughout southern California. To find one nearest you, visit [www.rockngem.com/showdates.asp](http://www.rockngem.com/showdates.asp)



### SEPM—Pacific Section Field Trip

In memory of Dr. John Cooper and his scientific contributions to the local area, a one and a half day field trip is planned beginning in Silverado Canyon continuing through to Crystal Cove, **Saturday and Sunday, Sept. 13-14, 2008**. For more information and to RSVP, contact Wayne Henderson at 714.278.2972 or [Whenderson@fullerton.edu](mailto:Whenderson@fullerton.edu)

### AIPG/AHS/IPGC/AESE Joint Annual Meeting

"Changing waterscapes and water ethics for the 21st century" and "Global Geoscience practice, standards, ethics and accountability". **Sept. 20—24, 2008** in Flagstaff, AZ. For more information, please visit [www.aipg.org/2008/AIPG-AHS-3IPGC.htm](http://www.aipg.org/2008/AIPG-AHS-3IPGC.htm)

### GRA 17th Annual Conference and Meeting

"Groundwater: Challenges to meeting our future needs" **Sept. 24-26, 2008** in Costa Mesa, CA. For more information, please visit [www.grac.org](http://www.grac.org) or contact Kathy Snelson at 916.446.3626 or [executive\\_director@grac.org](mailto:executive_director@grac.org)

### IGS is looking for speakers for 2009 meetings!

Thom Deane, Steve Mains, Patrice Copeland and Shelby Harrell have completed the 2008 schedule for speakers! If anyone would like to speak at an IGS meeting or has any suggestions for the 2009 schedule, please contact Thom or Steve.

## IGS Meeting Schedule

### **September 4, 2008 (Thursday)**

Fred Lange, LSA Associates (tentative)  
*Desert Depressions, Natural or Man-Made*

### **October 1, 2008 (Wednesday)**

Dr. Sally McGill, CSU, San Bernardino  
*Latest Pleistocene Slip Rate of the San Bernardino Strand of the San Andreas*

### **November 6, 2008 (Thursday)**

Dr. David Jessey, Cal Poly Pomona  
*Basaltic volcanism in the southern/central Owens Valley and its relationship to Neogene tectonics*

### **December 3, 2008 (Wednesday)**

Venessa Fava  
*Paleoecological and paleoenvironmental reconstruction of the Sycamore Canyon member of the mio-pliocene Puente formation, Chino Hills, San Bernardino County, California*

### **January 8, 2009 (Thursday)**

TBA

### **February 4, 2009 (Wednesday)**

Dr. Matthew Kirby  
*Paleoclimate of Southern California*

### **March 5, 2009 (Thursday)**

TBA

### **April 1, 2009 (Wednesday)**

TBA

### **May 7, 2009 (Thursday)**

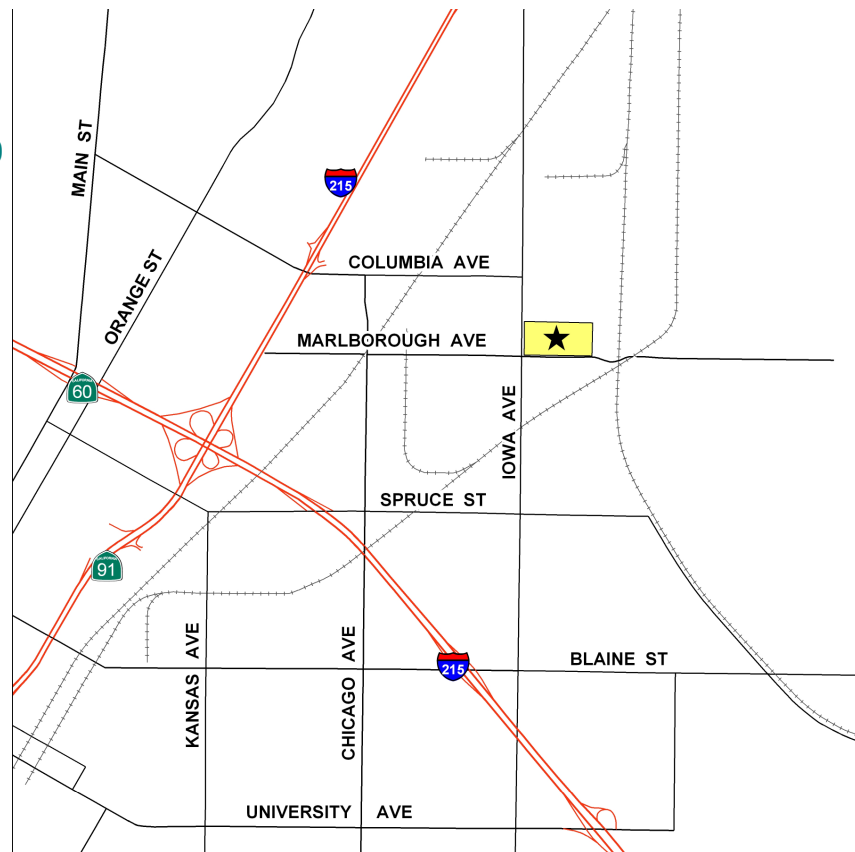
TBA

### **June 3, 2009 (Wednesday)**

TBA

**IGS MEETING LOCATION:**

**LSA Associates, Inc.  
1500 Iowa Ave, Suite 200  
Riverside, CA 92507**

**2008 IGS OFFICERS****President**

Greg Johnson, LADPW  
gjohnson@ladpw.org  
626.458.4923

**Vice President**

Thomas Deane, Deane Consulting, Inc.  
deanehydro@verizon.net  
909.747.4515

**Secretary**

Dixie Lass, Santa Ana RWQCB  
dlass@waterboards.ca.gov  
951.782.3295

**Treasurer**

Margaret Gooding, LSA Associates  
Margaret.gooding@lsa-assoc.com  
951.781.9310 x279

**Web Mistress**

Marina West, Joshua Basin WD  
marinawest@jbwd.com  
760.910.3447

**Web Master**

Ernie Roumelis, AKW Geotechnical  
eroumelis@verizon.net  
951.265.9849

**Newsletter Editors**

Shelby Harrell, CSU Fullerton  
shelby.harrell@csu.fullerton.edu  
760.680.0389

Patrice Copeland, Lahontan RWQCB  
pcopeland@waterboards.ca.gov  
760.241.7404

**Membership**

Steven E. Mains, Watermaster  
Support Services  
watermains@aol.com  
951.780.5636

**Inland Geological Society Newsletter**

c/o Shelby Harrell  
14982 Farmington Street  
Hesperia, CA 92345