



# Arizona Geological Society Newsletter

ARIZONA GEOLOGICAL SOCIETY, INC., TUCSON, AZ

JULY 2011

## July 5, 2011 DINNER MEETING

**Volker Spieth** will be our featured speaker. See abstract below.

- Where:** Sheraton Four Points Hotel, Wild Cat Room, 1900 E. Speedway Blvd. in Tucson
- When:** Cash Bar at 6 pm—Dinner at 7 pm—Talk at 8 pm
- Cost:** With reservation, members \$24, guests \$27, Students \$10 (or free with online reservation).  
Without a reservation, a \$3 surcharge will be added (if the hotel is able to accommodate you).

**RESERVATIONS: CALL 520.663.5295 by 5 p.m. on July 1, 2011.**

Please indicate low-salt, vegetarian, or vegan meal preferences. A coffee/salad/roll/dessert option is also available for \$18.

Please cancel if you are unable to attend. The hotel cannot guarantee that meals will be available without a timely reservation.

## ABSTRACT

### THE REVIVAL OF KUPFERSCHIEFER Cu-Ag DEPOSITS AND MINING IN EUROPE

By Volker Spieth

The copper mining revival in Germany and Poland depends on the famous Kupferschiefer-type Cu-Ag deposits, which have been well known in Central Europe since before the Middle Ages when the local aristocracy made their riches from copper and silver mining of the outcropping Kupferschiefer. Today, the Polish Kupferschiefer-copper mining company KGHM is the fourth largest copper producer in the world. New discoveries in Germany may develop into the next large copper mining district.

Kupferschiefer Cu-Ag-PGM deposits show specialized mineralogical aspects that have caused major scientific arguments. Today we know that the Kupferschiefer black shale is of upper Permian age. The development of the metallogenic concentrations lasted for at least another 25 million years. The source of the metals and their specific or rather unspecific but predictable placement in monotonous but diverse geological units have mystified many researchers, from the “syngenetic” to the “epigenetic” school of thought.

The deposits are characterized by a geochemical signature of parallel metallic zones of varying composition. They are relatively thin in vertical dimension and vast in lateral extent. The Kupferschiefer strata are essential as a geological cap for rising and laterally migrating metal solutions. pH, Eh, rock permeability, geologic environment, geothermal fluids and time are the controls of ore deposition. The occurrence of the deposits is always defined by consecutive, sub-parallel lateral bands starting with the “Rote Fäule” hematitic iron which usually is present over a very large lateral area. The next metallogenic “band” is that of economically interesting copper-silver sulfides containing silver and gold and PGM inclusions—from chalcocite to bornite to chalcopyrite with an appreciable amount of organic carbon. This is followed by overlapping bands of lead sulfides, zinc sulfides, and pyrite that grades into the barren, black Kupferschiefer shale. The understanding of these geochemical and metallogenic markers can lead geologists to new discoveries of very large copper-silver deposits that will keep producing for decades to come.

## About the Speaker:

**Volker Spieth** was born and educated in Germany, where he earned his B.Sc. degree at the Eberhard Karls Universität in Tübingen, his M.Sc. at the Rheinisch-Westfälische Technische Hochschule in Aachen and an MBA at the John. F. Kennedy Economic College in Esslingen (1966). He joined the Arizona Geological Society after moving to Tucson in 1999. Mr. Spieth has owned and operated his own junior exploration and project management consultancy company for 25 years. His work has resulted in the discovery of the Erzbuck gold deposit in the Black Forest of Germany, a hot springs type, high grade gold occurrence. His team discovered and developed the first European cyanide-heap-leach gold epithermal deposit, Cabo de Gata in Spain, the first post-communist-era vat leach gold operation of Boroo, near Ulaanbaatar, Mongolia, the Sarfartoq niobium deposit in West Greenland, and the Rhonshausen Kupferschiefer Cu-Ag-PGM deposit in Germany. He is currently working on his newest discovery, a large tantalum deposit in Rwanda, Central Africa, for development into an open pit operation.

Mr. Spieth has received awards from the governments of Germany and Mongolia, the Northwest Mining Association, and the Mining Chamber of Commerce in Johannesburg, South Africa. He has researched and co-authored more than 20 publications.

## Announcements

**CONGRATULATIONS** to AGS Member **Barbara H. Murphy**, who received the Martin Van Couvering Award from the American Institute of Professional Geologists (AIPG). Ms. Murphy is a Senior Geologist at Clear Creek Associates in Scottsdale, AZ, and she is President-Elect of AIPG.

Good news for students! The AGS Executive Committee has agreed to provide a limited number of free meals at our dinner meetings to students who make **advance online** reservations. The dinners are made possible through industry sponsorship of the monthly meetings. Students also are encouraged to sign up for free membership. AGS is a great way to make contact with prospective employers!

If your company is interested in a sponsoring a dinner meeting, please contact Ann Pattison, AGS VP of Marketing.

Being an AGS officer is fun, and a great way to meet people. Mark Cocker is seeking new people to fill Executive Committee positions for 2012. If you are interested, or if you just want to learn more about the duties, please leave a message on the AGS answering machine (520-663-5295) and Mark will give you a call.

On June 20, Secretary of the Interior Ken Salazar announced his decision to make an emergency withdrawal for six months of approximately one million acres of federal lands near Grand Canyon National Park from hard rock mining claim location and entry under the 1872 Mining Law while the Department continues to evaluate whether to withdraw these lands from new mining claims for 20 years. The 20-year withdrawal is the preferred alternative that will be presented in an Environmental Impact Statement to be released in the Fall of 2011. Valid existing claims are not affected by this announcement. The Department of Interior issued a fact sheet regarding the decision. It can be read online at the following link: <http://www.doi.gov/news/pressreleases/loader.cfm?csModule=security/getfile&pageid=250397>

The June dinner meeting was sponsored by:

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The Bisbee Mining & Historical Museum has announced the October Turquoise Hunt. They are partnering with Freeport-McMoRan Copper & Gold, Copper Queen Branch, to host the popular **Hunt for Turquoise** on October 7-8, 2011. If you are a member of the Museum, cost is \$20 per person; \$30 for non-members. Call the Museum at 520-432-7071 for more information.

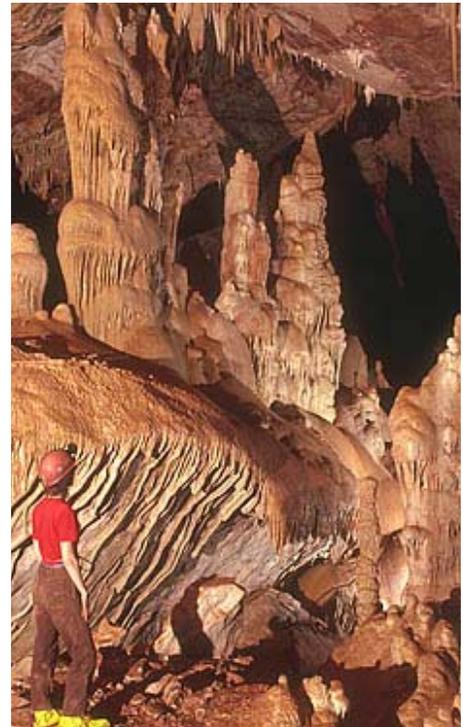
From the AGS Secretary: The Member Spotlight column will resume next month.

## Kartchner Carverns Field Trip

By Jan Rasmussen

Kartchner Caverns State Park was a magical and educational experience for the 37 geologists and guests on the Spring AGS field trip on Saturday afternoon, May 28, 2011. There was time before the tours to explore the museum, with its scientific explanations of how caves form, ground sloth reconstruction, and 3-D model of the caves, and with its tunnel for kids to crawl through. The group split into two groups for separate tours by Arizona State Park tour guides. The guides pointed out the Mississippian Escabrosa Limestone on the skyline that is host to the caverns and explained a little of the geologic history. They told how the cave was discovered in 1974 through a sinkhole (seen near the tramway road) by Randy Tufts and Gary Tenon. The discovery was kept secret until it became part of the state park system in 1988.

The strong pre-entry indoctrination into proper 'living' cave behavior for visitors emphasized the care being taken by the Park to ensure that human traffic (breathing, clothing lint, and skin oils) would not destroy the cave and would be enjoyed for hundreds of generations. The easy walking tour led through passages dimly lit only during our traverse. We saw all sorts of speleothems—stalactites, stalagmites, columns, cave straws, helictites, cave bacon, flow stone, and many others—including some aragonite crystals. The highlight was sitting in the amphitheater for several minutes to contemplative music, while lights shone on various parts of the marvelous cave formations in the Big Room. The grand Kubla Khan, a massive column of a joined stalactite (tight to the ceiling) and stalagmite (mound on the ground), was especially awe inspiring.



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## Field Trip to the Salton Sea

Doug Shakel, VP of Field Trips, has been busy planning a three-day field trip on November 11-13 to the Salton Sea. Tentative plans are as follows:

- Participants will be responsible for getting to Yuma, AZ on the evening of November 10. Participants will be staying each night in Yuma. The cost of the trip, including hotel, is estimated at \$280-\$300 per person, double occupancy. Transportation from Yuma will be provided each day to the various points of interest on the trip.
- The trip will include a tour of a nuclear-powered desalinization plant and a trip to the Salton Sea.
- The trip will end at noon on Sunday, November 13, allowing plenty of time to drive back home.

Additional information will be posted in future newsletters as the plans develop.

## New and Notable Publications:

The USGS recently published the report on their numerical groundwater model for the Verde River Basin. It can be downloaded from the USGS website ([usgs.gov](http://usgs.gov)). The complete citation is:

Pool, D.R., Blasch, K.W., Callegary, J.B., Leake, S.A., and Graser, L.F., 2011, Regional groundwater-flow model of the Redwall-Muav, Coconino, and alluvial basin aquifer systems of northern and central Arizona: U.S. Geological Survey [Scientific Investigations Report 2010-5180](#), v. 1.1, 101 p.

A new AZGS publication by Senior Geologist Jon Spencer, calculates basin volumes for their CO<sub>2</sub> sequestration potential, as part of a DOE-funded project with WESTCARB (West Coast Regional Carbon Sequestration Partnership). Spencer also calculated the sediment volumes below 800 meter depth, where CO<sub>2</sub> should remain in a liquid form due to overburden pressures.

Download the entire report here: [http://repository.azgs.az.gov/uri\\_gin/azgs/dlio/1080](http://repository.azgs.az.gov/uri_gin/azgs/dlio/1080)

## More on Field Trips!

Another possible field trip that Doug Shakel, AGS VP of field trips, is looking into is one to view earth fissures. Brian Conway's talk at the June dinner meeting regarding these features generated a lot of enthusiasm for the topic.

Planning is in the earliest stages. Check future issues of this newsletter for more information.

## 2011 AGS MEMBERSHIP APPLICATION OR RENEWAL FORM

Please mail check with membership form to: Arizona Geological Society, PO Box 40952, Tucson, AZ 85717

Dues (check box)  1 year: \$20;  2 years, \$35;  3 years: \$50;  full-time student (membership is free)

NEW MEMBER or RENEWAL? (circle one) Date of submittal \_\_\_\_\_

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

Company: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Street: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Work Phone: \_\_\_\_\_ Home Phone: \_\_\_\_\_

Fax Number: \_\_\_\_\_ Cellular Phone: \_\_\_\_\_

E-mail: \_\_\_\_\_ Check this box if you do not have an email address

***Starting in 2011, all newsletters will be sent by email. If you do not have an email address, we will mail a hard copy to you, but we cannot guarantee timeliness.***

If registered geologist/engineer, indicate registration number and State: \_\_\_\_\_

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