



# Arizona Geological Society Newsletter

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SEPTEMBER 2013

## SEPTEMBER 3, 2013 DINNER MEETING

**Who:** Peter Reiners will be our featured speaker. See abstract below.

**Where:** Sheraton Tucson Hotel and Suites, 5151 East Grant Road, at the intersection of Grant and Rosemont on the North side of Grant in the *Pima Room*. The Pima Room is located on the second floor in the northwest corner of the hotel.

**When:** Cash Bar at 6 p.m.—Dinner at 7 p.m.—Talk at 8 p.m.

**Cost:** Members \$27, Guests \$30, Students are free with an online dinner reservation (\$10 without).

**RESERVATIONS are REQUIRED by 11 a.m. Thursday, August 29. Reservations can be made on the AGS website ([www.arizonageologicalsoc.org](http://www.arizonageologicalsoc.org)). If you do not have internet access you may call 520-663-5295.** Please indicate regular (Chicken Alfredo) vegetarian, or cobb salad meal preference. Please cancel by Thursday August 29 at 11 a.m. if you are unable to attend.

## ABSTRACT - Geochronology of Secondary Fe- and Mn-oxides in Bedrock

Peter Reiners, Professor, Department of Geosciences, University of Arizona

Secondary oxide/oxyhydroxide minerals are common in bedrock in a wide variety of geologic settings, where they form as a result of interaction of rocks with relatively oxidizing fluids. In many cases they provide a potential record of interaction of the lithosphere with the atmosphere/hydrosphere over time, posing the potential to understand the timing and conditions of fluid flow along faults and fractures or within basins, the history of near-surface exposure of basement rocks over billion-year timescales, and supergene ore formation. One of the first order challenges in interpreting the record of secondary oxides is a question of timing: when they formed, what their thermal histories were, and in some cases when they were compositionally modified. Most commonly used radioisotopic dating techniques are poorly suited to this because of parent nuclide concentrations that are too low or initial daughter concentrations that are too high (or both) in the minerals of interest, such as hematite, goethite, and various Mn-oxides. The (U-Th)/He system, however, has potential for these applications because of the affinity of oxide minerals for U and Th and low initial He concentrations. In this talk I will review recent progress in (U-Th)/He dating of secondary bedrock-hosted oxides from several settings in the western U.S. and their geologic implications. Examples include Precambrian and Mesozoic hematite in crystalline basement fractures, Cenozoic hematite and Mn-oxides along detachment faults and in supergene oxides, and Plio-Pleistocene ages of diagenetic oxides in sandstones of the Colorado Plateau. While straightforward geologic interpretations are possible in some cases, several examples show that principal challenges for routine application include post-formation U-Th uptake and diffusive He loss. However, in the lemons-to-lemonade tradition of geochronologic development, in many cases these complications pose potential for understanding geologic phenomena besides simple formation ages, including thermal histories and the timing of groundwater interaction in the shallow crust.

## About the September Dinner Meeting Speaker

**Peter Reiners** is Professor and Head of the Department of Geosciences at the University of Arizona, where he has been on the faculty since 2006. He is a geochemist and geologist with wide ranging interests in Earth and planetary science, many of them oriented around geochronology and thermochronology, especially using the (U-Th)/He system. He is a Fellow of the Earth System Evolution Program of the Canadian Institute for Advanced Research, and received an EU Marie Curie Fellowship to study at the Centre de Recherches Pétrographiques et Géochimiques (CRPG) in Nancy, France from 2012-2013. He has served as Associate Editor of *Geochimica et Cosmochimica Acta*, *Chemical Geology*, and the *American Journal of Science*. Prior to coming to UA, Peter was on the faculty at Yale University and Washington State University, was the Texaco Postdoctoral Scholar at the California Institute of Technology, and received his PhD and MS in Geological Sciences from the University of Washington, and BS in Geology from Carleton College.



## 2014 Slate of Nominees—AGS Officers & Councilors

Don't miss the September 3rd dinner meeting, when we will vote on the following slate of officers for 2014. If you are unable to attend the meeting, you may vote online. All AGS members, with a known email address, have been sent an email with a link to an online ballot and a link to the 2013 Motions of Significance that the Executive Committee is asking the membership to approve.

If you wish to vote online, you must do so before 5 p.m. on August 30. If you vote online, you will not be permitted to vote again at the meeting. Only one vote per member.

President	Kim Wilson, Silver Bell Mining
VP Programs	Robert J. Kamilli, U. S. Geological Survey
VP Field Trips	Ralph J. Stegen, Freeport-McMoRan Exploration Corp.
VP Marketing	Ann D. Pattison, Independent
Treasurer	Michael Conway, Arizona Geological Survey
Vice Treasurer	Rachel C Feuerbach, University of Arizona Student
Secretary	David F. Briggs, Independent
Vice Secretary	Trevor Cole, Haley & Aldrich
Past President	Alison H. Jones, Clear Creek Associates
Councilor 1 (14-16)	Bruce M. Walker, Retired Chevron Questa
Councilor 1 (14-16)	Lilly J. Jackson, University of Arizona Student
Councilor 2 (13-15)	Richard Jones, Retired
Councilor 2 (13-15)	Coleen Brown, Retired American Red Cross
Councilor 3 (12-14)	Kenneth J. Hollett, Retired, U.S. Geological Survey
Councilor 3 (12-14)	Isabel Fay, University of Arizona, Doctoral Student

## Up Coming Field Trips

It's not too late to sign up for the three field trips scheduled in the next couple months. The registration process is easy on the AGS Events web page,

<http://www.arizonageologicalsoc.org/Default.aspx?pageId=1559889>

**August 30 - University of Arizona Tree-ring Research Lab** in Tucson. No charge. Time: 2-4 pm. Tour this state-of-the art tree-ring facility on the UA Campus. Established in 1937 by A. E. Douglass, founder of the modern science of dendrochronology, the Laboratory of Tree-Ring Research is recognized worldwide as a preeminent center for the advancement of tree-ring techniques and the broad application of dendrochronology in the social and environmental sciences. Children are welcome.



**September 25-28 - New Mexico Geological Society Annual Fall Field Conference**, I-40 from Flagstaff to Grants, NM (co-hosted by AGS). NMGS invites AGS members to participate in the pre-meeting field trip of the South Rim of the Grand Canyon, the 3-day field trip to Grants, and the post-meeting trip. Day 1 will tour Sunset Crater with a banquet meal at Meteor Crater before stopping at Winslow for the evening. Day 2 will be spent at Petrified Forest National Park with a stay in Gallup. Day 3 offers options to Tour Mount Taylor, the tuffs of San Mateo Canyon, or McCarty's lava flow field. There are only a few spots left so you must act fast. See <http://nmgs.nmt.edu/ffc/registration/home.cfm> for registration details.

**\*\*\*Only 21 Spaces Left\*\*\***



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## Another Field Trip



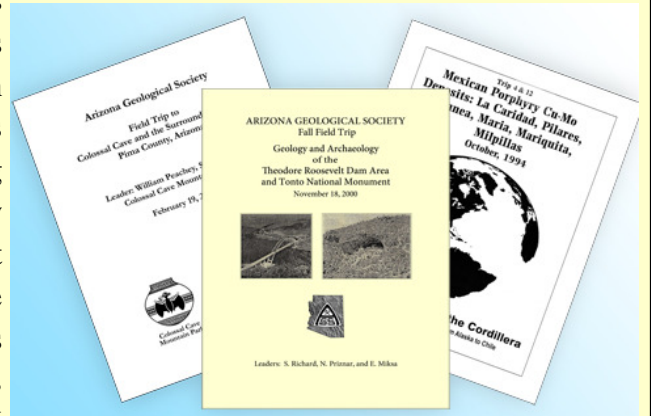
**October 4 - H. Wilson Sundt Generating Station in Tucson** near I-10/Irvington Rd. No charge but the participant registration list is required by TEP early so please sign up now. This coal-fired and natural-gas powered facility is the primary electrical generating station in the Tucson area. Tour the power plant, coal yard, rotary train dumper, recycling area, equipment and training yards, and the solar test yard. Children over 16 welcome. See AGS Events page for additional information.

<http://www.arizonageologicalsoc.org/>

## Publication Archive is now Online

AGS proudly announces a new feature available on the website. **Out-of-print AGS Digests and Guidebooks** are now available for you to download for your personal use. This includes AGS Digests 1 through 12 and guidebooks dating from 1950 through 1999. More recent guidebooks (2000-2007) are available to **members** only. We hope this is a great incentive to entice a few to join the Society.

This ambitious endeavor is finally coming to fruition thanks to the efforts of several AGS members. Publications Committee Chair **Kevin Horstman** has led the effort with his archiving work and professional standards. He has carefully compiled more than 100 guidebooks by scanning them with character recognition software, digitally removing artifacts, and resizing oversize pages to fit standard paper sizes. He's reviewed each page to ensure we have a high-quality scan and no copyright violations through use of other published illustrations or material. This archiving work was made possible owing to SRK



Consulting's contribution of office space and computer/scanning equipment (**Cori Hoag**). Several AGS members (**Don Hammer, Syver More, Jan Rasmussen**) have generously donated materials to be scanned. We greatly appreciate the temporary loan of any guidebook you think we are missing. The Publication Archive is accessed via the AGS website but is hosted and maintained thanks to the Arizona Geological Survey (**Lee Allison, Mike Conway**). We hope you will find the publications of use in your various research efforts. More guidebooks are being added daily so check back often.

See <http://www.arizonageologicalsoc.org/Default.aspx?pageId=1664230>.

## In-Print AGS Digest and Bulletins are available for purchase at the Arizona Experience Store.



Visit the **Arizona Geological Survey's Arizona Experience Store** on 416 W. Congress #100 in Tucson for direct purchase or mail order. Order information is found on the AZGS website (<http://store.azgs.gov/product-type/books/arizona-geological-society>) or you may contact them at (520) 770-3500.

Digest and Guidebooks are also available at the monthly dinner meeting.

## 2013 MEMBER DIRECTORY STATUS

The AGS Member directory is in press and will be mailed to current members and advertisers in early September. Please make **sure** we have your correct address as the directory is sent by bulk mail, and thus it will not be forwarded by the post office in the event of a changed or incorrect address. AGS is grateful for the support of our advertisers who completely offset the production costs, thereby providing additional support for our student members.

## Field Trip Report

By Alison Jones

Alison Jones and Fred Beck recently led a successful 8-day raft trip through the Grand Canyon. AGS members who were able to participate included Rich Laveille (Freeport-McMoRan) and Jim Mayor. In all, the group included 10 geologists, 5 lawyers (hey, they're everywhere!), 2 physicians, an architect, an engineer, several entrepreneurs, and an assortment of nature lovers and adventurous souls. Highlights included the Butte Fault at Lava Canyon, Deer Creek, Havasu Creek, National Canyon, Matkatimeba, and many more. Hatch River Expeditions was our outfitter.

Alison has another trip reserved for July 6-13, 2014. If you are interested, please contact her as soon as possible. We expect the trip to fill quickly.



Above Alison Jones shows the group footprints in the Coconino Sandstone and discusses aeolian depositional environments.

Left: The group hikes up North Canyon to look at the formations making up the Supai Group.

### Welcome New AGS Members

Kenneth Belsher, retired  
 Ramon Chavez, student at UA  
 Elzbieta Czyzowska-Wisniewski, student at UA  
 Marisa Lerew, Asarco

Scott McFadden, Resolution Copper  
 George Riddle, Rose Mine  
 Thornwell Rogers, Hallelujah Resources  
 Daniel Russin, SRK Consulting



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 The future is yours.

AGS is grateful to  
 BHP Billiton for  
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 support of our  
 student members!

#### Sustainability

In BHP Billiton, we achieve sustainability when everyone builds and maintains meaningful, long-term relationships with internal and external stakeholders.

That is why we are proud to sponsor the student dinners of the Arizona Geological Society.



[Careers.bhpbilliton.com](http://careers.bhpbilliton.com)

### 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

**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 you are a registered geologist/engineer, indicate your registration number and State: \_\_\_\_\_

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

Enclosed is a \_\_\_\_\_ tax-deductible contribution to the AGS Scholarship Fund.

Enclosed is a \_\_\_\_\_ tax-deductible contribution to the AGS Greatest Needs Fund.