



Arizona Geological Society Newsletter

FEBRUARY 2019

February 5th, 2019 DINNER MEETING

Who: Dr. Jeffrey E. Post is the 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 **SABINO BALLROOM** (enter at northwest corner of the building) and go upstairs to the meeting room.

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

Cost: Members \$30, Guests \$33, Students Members free with online reservation (\$10 without).

RESERVATIONS ARE REQUIRED: Reserve on the AGS website (<http://www.arizonageologicalsoc.org/events>) by 11 am on Friday, February 1st. Please indicate Regular (Top Sirloin with Mushrooms & Au Jus), Vegetarian (Chef's Choice), or Salad (Cobb Salad) meal preference. Please cancel by **Friday, February 1st at 11 am** if you are unable to attend - no shows and late cancellations will be invoiced.

The February dinner meeting is sponsored by:



ABSTRACT:**The Hope Diamond and Smithsonian National Gem Collection**

By Dr. Jeffrey E. Post, Smithsonian Institution, Curator of the U.S. National Gem and Mineral Collection

The Hope Diamond is one of the most famous gemstone in the world. It is familiar to most people because of its fascinating human history which includes kings and thieves and perhaps a curse or two, but it is also a rare blue diamond, the largest and finest of its kind known. Despite its long history in the public eye, the diamond still prompts many questions. The United States National Gem Collection at the Smithsonian Institution is also well-known for its many other world-class gems and jewelry pieces such as Polly Logan's 423 carat sapphire, the historic Napoleon Diamond Necklace and Blue heart Diamond, and the spectacular Carmen Lúcia Ruby. This beautifully illustrated talk by the Curator-in-charge, Dr. Jeffrey Post, will explore the science and lore behind some of the famous and lesser known gems in the National Collection, as well as highlight some exciting recent additions to the collection.

**ABOUT THE SPEAKER**

Dr. Jeffrey Edward Post, a native of Wisconsin, received Bachelor of Science degrees in geology and chemistry from the University of Wisconsin - Platteville, and his Ph.D. in chemistry, with a specialty in geochemistry, from Arizona State University. Prior to joining the Department of Mineral Sciences at the Smithsonian Institution in 1984, he was a Postdoctoral Research Fellow for three years in the Department of Geological Sciences at Harvard University.

He is currently Chairman of the Department of Mineral and since 1991 has served as Curator of the U.S. Natio-

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-nal Gem and Mineral Collection. Dr. Post served as the lead Curator for the Janet Annenberg Hooker Hall of Geology, Gems and Minerals that opened in 1997.

His areas of research interest include mineralogy, gemology, geochemistry, crystallography, and electron microscopy. He has published more than 100 scientific articles in these fields. He is the author of The National Gem Collection.

CONTEST!!!

The first person to correctly identify the gemstones in Jeff Post's photo will win a free dinner at the next AGS meeting they attend! Send your guesses to Karen Wenrich at crystalunlimited@aol.com by 8:00 PM on February 4, 2019. The winner will be announced at the dinner meeting.



Arizona Geological Society Membership Stats (1/30/2019)

Total Membership	Professional Members	Student Members	Organizational Members
413	344	62	7

Arizona Geological Society awarded 2018 scholarships to recipients at its December dinner meeting.

2018 M. Lee Allison Scholarship Recipient: Lorraine Carnes



2018 Courtright Scholarship Recipient: Alexandra L. Wallenberg



Member Spotlight: Longtime AGS member and professor Steve Reynolds honored with ASU's highest teaching honor



Steve Reynolds, Arizona Geological Society member and Professor of Geosciences at Arizona State University, was formally inducted last month as a President's Professor. The President's Professor is ASU's highest honor for teaching and scholarship of learning. The honor rewards "enthusiasm and innovation in teaching, the ability to inspire original and creative work by students, mastery of subject matter and scholarly contributions". Dr. Reynolds has received the ASU Department of Geology Outstanding Teacher Award four times. Apart from trying to engage students in hands-on experiences with geology, Steve has done research in how students learn and in how they think about geology (the new field of geocognition).

From 1981 to 1992, Steve was employed at the Arizona Geological Survey (AZGS). He has many peer-reviewed articles, and has authored and co-authored 71 AZGS reports and maps. In fact, he is co-author on the 'Geologic Map of Arizona (2000)'. Steve has also held numerous offices in the AGS Executive Committee.

Rapid infilling of a fresh earth fissure in southern Pinal County, Arizona

From Arizona Geology eMagazine, Arizona Geologic Survey



In January 2017, J.P. Cook, AZGS' Earth Fissure program manager, reported on a nearly two-mile long fissure in the Tator Hills earth fissure study area of southern Pinal County (Cook, 2017). The fissure was divided into sub-equal lengths of an older, northern tract, and a younger southern tract.

The northern tract first appeared prominently in Google Earth imagery in December 2014. When examined in 2017, it was largely backfilled with sediments from sidewall collapse and incision along captured drainages. The younger, southern tract did not appear in Google Earth imagery until April 2016. In contrast to the north section, it displayed sharp vertical walls, a deep v-shaped geometry (maximum depth about 30 feet), with piles of angular soil blocks along wider open sections.

Cook revisited the younger, southern tract in January 2019; two years after his first visit. His observations, bulleted below, show a rapidly degrading and infilling fissure. Figure 2 from the Houston Ave. fissure in Apache Junction illustrates extensive headward erosion that may accompany some earth fissures.

- When first examined, the fissure was steep-sided and tapered to a deep narrow crack as much as 30 feet deep. In January 2019, maximum depth was approximately 8 to 10 ft deep, indicating 20 to

22 feet of backfill. Fissure sidewalls remain steep-sided but infilling with sand and sediment from captured drainages produced a broad, flat-bottomed channel.

- Fresh headcutting, incision and erosion along drainages entering the fissure from the east is dramatic. Drainages entering the fissure from the west are abandoned. Figure 2 provides a drone image overview of extensive headcutting along an earth fissure.
- Fissure width has increased over the past two years as large blocks of sidewall have collapsed into the fissure. Parallel cracks running along the fissure and leaning pillars of soil along some deeper sections indicate this process is ongoing.
- At the southern-most extent, what were once narrow cracks or discontinuous potholes in January 2017 are now connected to form a continuous crack several feet wide and up to 10 feet deep. The overall fissure length is unchanged since 2017.

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- At the southern-most extent, what were once narrow cracks or discontinuous potholes in January 2017 are now connected to form a continuous crack several feet wide and up to 10 feet deep. The overall fissure length is unchanged since 2017.
- An abundance of tire tracks testifies to a number of fissure visits by 4-wheel track vehicles. Note: anyone driving across a fissure zone should exercise extreme caution, especially along the edge of a fissure. Sidewalls are highly unstable and fissure zones frequently include multiple fissures, some of which may be incipient, but prone to collapse, nonetheless.
- Coyote and javelina tracks are evidence that animals use the fissure channel as a transportation corridor.

Final comment. Rapid backfilling of the southern Pinal County earth fissure does not reflect the history of other fissures. To this day, the long-lived Roger fissure in Maricopa County (Arizona Geological Survey, 2009) maintains steep sidewalls and a deep V-shaped channel. Additionally, it is not uncommon for fissures to reopen and recapture the original deep V-shaped geometry.

AZGS staff will continue to monitor the Tator Hills fissures remotely via Google Earth imagery and with annual or biannual visits.

To read the original article with additional imagery, visit:

<http://blog.azgs.arizona.edu/blog/2019-01/rapid-infilling-fresh-earth-fissure-southern-pinal-county-arizona-w-comment-ken>

The article also contains additional resources and reading regarding earth fissures in Arizona, as well as commentary from Ken Ferguson, a Sr. Geologist at Wood Environment & Infrastructure Solutions, Inc.

Please contact the AGS Secretary if your company is interested in advertising in this monthly newsletter.

Arizona Geological Society is grateful to Freeport-McMoRan, Inc. for their generous support of our student members!

Freeport-McMoRan sponsored student dinners for the 2018 AGS monthly meetings.



AGS MEMBERSHIP APPLICATION OR RENEWAL FORM

YOU CAN RENEW OR SIGN UP as a new member and pay online. Please go to our website, arizonageologicalsoc.org. Or use the form below if you are more comfortable with the old school approach.

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

Dues (check box) 1 year: \$35; 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 registered geologist/engineer, indicate registration number and State: _____

Enclosed is a _____ tax-deductible contribution to the J. Harold Courtright or the M. Lee Allison Scholarship Funds.