



# Arizona Geological Society Newsletter

SEPTEMBER 2011

## September 6, 2011 DINNER MEETING

**Dr. Joseph H. Simmons** 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 p.m.—Dinner at 7 p.m.—Talk at 8 p.m.  
**Cost:** With reservation, members \$24, guests \$27, Students \$10 (students 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 September 2, 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—Solar Energy Research at the University of Arizona

### Joseph H. Simmons, Director of the Arizona Research Institute for Solar Energy

The use of solar energy to fuel our energy needs has many attractions. It is renewable; it can reduce the use of fossil fuels; it can be clean and abundant; it can reduce water use for energy production. Solar energy utilization can also fuel economic growth in the State of Arizona, as we have the largest supply of sun in the U.S. But the broad adoption of solar energy and its anticipated economic growth require more than abundant sunshine. These require the development of critical technologies, the adoption of policies that support renewable energy utilization and the conscious decision by the populace to bear the cost of the necessary change. Economic growth requires convincing solar companies to relocate to Arizona and using the savings from any reduction in fuel costs (\$3 billion annually) to power economic growth.

University research programs at UA and AzRISE span (1) research and development of efficient solar energy conversion materials and the design of large mirror and holographic concentrators for CPV systems, (2) accurate measurement and modeling of solar system performance in the Arizona sun, (3) the design, construction and development of energy storage systems, (4) the development of control systems for integrating solar energy-based electricity generation with energy storage and conventional utility resources to meet electrical load, (5) economic analyses of various renewable energy alternatives for meeting electrical demand, (6) the development of local policy for stimulating adoption of renewable energy and subsequent economic growth, (7) education at the university level, of K-12, of a trained workforce and of the general public, and (8) outreach to industry, the utilities, the state legislature, regulatory bodies and the consumers.

This presentation will focus on solar energy research and development activities at UA and especially at AzRISE. The talk will highlight ongoing AzRISE research on Compressed Air Energy Storage whose solution rests on the development of high efficiency expansion turbines (Simmons and Muralidharan) and suitable underground geology for storing compressed air (Sternberg).

**Joseph H. Simmons** is the Founding Director of the *Arizona Research Institute for Solar Energy (AzRISE)* and Head of the Department of Materials Science & Engineering at the University of Arizona. Simmons graduated with a BS in Physics (University of Maryland), an MS in Physics (John Carroll University) and a PhD in Condensed Matter Physics (Catholic University), and has held positions at University of Florida, Catholic University of America, the National Institute of Standards and Technology and at NASA. His topics of study have included solar energy and photovoltaics, technology and economics of energy storage and the smart grid, optical properties of materials, condensed matter physics, optical spectroscopy, glass science, viscosity and structural relaxation in liquids, mechanical properties and fracture of solids and computational materials modeling. Simmons is the author of over 110 refereed journal articles, 13 U.S. patents, 4 book chapters, editor of 2 books and is the co-author of a text and reference book, "Optical Materials" (Acad. Press, 1999). Simmons was Senior Editor of the *Journal of Non-Crystalline Solids* for 12 years, Fellow and former Trustee of the American Ceramic Society and past chair of its Glass and Optical Materials Division.

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**Joseph H. Simmons—Continued from Page 1**

Over the past 5 years, Simmons has been active in solar/renewable energy in Arizona. He served on the Governor's Solar Roadmap Committee, as Chair and organizer of the PV 2008 International Workshop, and as Co-Chair of the Arizona Renewable Energy Storage Technologies (AzREST) that includes all Arizona utilities, and electrical transmission agencies (WAPA, Sunzia). Simmons has assisted Arizona electric utilities, solar companies and municipalities with renewable energy plans, and University of Arizona student teams with building and racing Solar Race Cars and with participating in the Solar House Decathlon Competition in Washington DC in 2009.

## Announcements

Alison Jones is soliciting interest from AGS members for an 8-day **Grand Canyon Geology raft trip**, starting on July 22, 2012. This year's trip was a huge success!! Our outfitter will be Hatch River Expeditions, and we have requested Stan Beus to be our geology guide again. Cost will be \$2875, which includes all camping gear, fabulous food, helicopter flight out, plane flight back to Marble Canyon or Las Vegas, and motel room at Cliffdwellers on July 21. Cost does not include transportation to Marble Canyon before the trip or boatmen's tips. A \$500 refundable deposit will hold your spot. Call Alison at 520-622-3222 or send her an email at [ajones@clearcreekassociates.com](mailto:ajones@clearcreekassociates.com) for more information.

If your company is interested in sponsoring an AGS dinner meeting, contact Ann Pattison, AGS VP of Marketing. Sponsorships make it possible for AGS to provide free dinners to students.

**Conference Announcement:** Opportunities for Alternative Energy Development in Arizona and the Southwest—Geologic/Hydrologic Considerations

Tempe, Arizona, October 27-28, 2011

Sponsored by AEG and the Arizona Land Subsidence Group

More information about the presenters/topics, sponsorship, exhibits, and registration can be found at this link:

<http://www.aegweb.org/i4a/pages/index.cfm?pageID=5464>

## FIELD TRIPS

VP of Field Trips, Doug Shakel, has been very busy organizing two exciting field trips. Some of the details have not been ironed out yet, but both trips promise to be a fun way to spend a day or weekend with fellow geologists.

### October 1, 2011 — Subsidence Cracks and Fissures in Cochise County

Joe Cook of the Arizona Geological Survey's "Earth Fissure Center" (EFC) will lead this trip to a relatively new set of fissures that has developed south-southeast of the Willcox Playa, in Cochise County. We will assemble our group at the DeConcini Building of the University of Arizona before 8:30 a.m., and drive to Cochise Co. in AGS-provided vans. (For participants coming from east or southeast of Tucson we can arrange some kind of rendezvous point.) Cost per person will be on the order of \$40-45. Walking will be on generally level ground, but with lots of low, leg-scratching shrubbery (i.e. DON'T wear shorts!) Total walking distance will likely be about 1½ miles.

### November 10-13, 2011 — Origin of the Salton Sea

A detailed summary of this trip was included in last month's newsletter. Estimated trip cost of \$300-350 per person will include three nights accommodation in Yuma (based on double occupancy), including full buffet breakfasts, van transport in and out of Yuma for day excursions in California and Mexico, and visits to and along the Salton Sea. This trip will involve a minimum of walking, and is suitable for young people down to age 14 who might have either a historical or geographic/geological bent. November weather in the Yuma area and southeastern California is usually pretty mild, and precipitation is extremely unlikely. Bring your valid passport or border crossing card, because we'll make a couple of hours traverse of the Colorado River Delta on the Mexican side of the US/Mexico border.

Watch for additional details regarding both of these trips in future editions of this newsletter or on the AGS website.

## September Member Spotlight—Robert E. Powell

**Robert E. (Bob) Powell** was born in Mineola, NY. In his youth he lived on a farm in southern New Jersey where his parents raised chickens and grew asparagus. He also lived in northern California (Sunnyvale), southern California (Redondo Beach and Torrance), Pennsylvania (Yeadon, near Philadelphia), Long Island again (Massapequa), New Hampshire (Boscawen and Loudon), and Connecticut (Trumbull). In Boscawen, the Powells lived in Daniel Webster's early 19<sup>th</sup> century homestead, marked by a granite monument along the highway, that had wide pine board floors and window pockets for "Indian shutters". Bob attended Middlebury College in Vermont where he received an A.B. in Geology in 1969. From there he headed west, and received an M.S. in Geology from Caltech.



Bob and Manya Powell atop Haleakala, Maui, Hawaii

Bob volunteered for the Navy and went to Officer Candidate School in Newport where he set the record for the obstacle course and was a Distinguished Naval Graduate. From there they sent him to Combat Information Center Officer, Anti-submarine Warfare, and Antisubmarine Aircraft Control schools. He eventually served as a First Lieutenant and Combat Information Center Officer on the destroyer Charles H. Roan (DD-853), which was deployed to the Persian Gulf and Indian Ocean, first, and then around the world.

Bob returned to Caltech and received his Ph.D. in Geology with a minor in Geophysics in 1981. He began working at the USGS in 1982 and has worked on regional mapping and tectonics in southern California, in the Belt Supergroup in north Idaho, and in the Kootenai arc of northeasternmost Washington.

Bob and his wife, Manya, live in Tucson with a friendly, rabbit-chasing Australian cattle dog-shepherd mix named Belle, and a feline brother and sister team, Sam and Chloe.

**How did you first become interested in geology?** When I signed up for freshman courses at Middlebury, I misunderstood the catalog and did not think I could take physics concurrently with calculus. In looking for another science course to take, I was intrigued by the description for geology. I liked being outdoors, I had a penchant for picking up interesting-looking rocks, and I wanted to take a science course. So I signed up. During the first week of classes, the class was bused to a marble quarry where we learned to map—limestone beds, a dike, talus cones shed from the quarry walls, etc.—and to interpret the sequencing of the various events that we represented on our maps. By spring, we were mapping folds and thrust faults in Paleozoic strata incompletely exposed beneath glacial deposits in a pasture on a local farm. In the intervening winter months, we had a multi-week assignment in which we were given several geologic maps of the Paradox salt basin. The cross sections and interpretative text of the maps had been removed and our assignment was to study the map relations and unit descriptions, construct our own cross-sections, and figure out the geologic history. None of us had ever heard of a salt anticline or knew how they grew. I found these experiences to be exhilarating and so real that I was completely hooked and signed up as a geology major before the end of the year.

**What was your first job?** Aside from childhood jobs, my first job was a summer job with the Avco-Lycoming factory in Stratford, Connecticut that produced aircraft engine parts. The first summer I worked the night shift on the factory floor, deburring and cleaning machined metal parts. The second summer, I moved to the front office where I helped put together graphics for business presentations.

**What was your first job as a geologist?** My first geology job was as a field assistant to Peter Coney helping to carry out a gravity profile of a large caldera on the Mogollon rim in New Mexico.

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**Robert E. Powell** (*continued from Page 3*)

My first solo job was as a consultant for White Pigment Co. based in York, PA and a subsidiary of Vermont Marble. The company was planning for their future as they anticipated depleting their existing quarry near York and wanted to know what other prospects existed nearby. I provided the company with a map and cross sections of the local geologic setting of their quarry. They were pleased enough to hire me later to map marble resources in northern New Jersey. Many years, later, in the late 1970s, Vermont Marble had been acquired by a Swiss Company, Pleuss-Stauffer, which also acquired some white marble properties along the north flank of the San Bernardino Mountains in southern California. I was hired briefly to assess resources in and near their properties.

**What is your most memorable field experience?** I guess the misadventures come to mind most readily. Being on a field trip decades ago with California and Arizona geologists to look at metamorphosed Mesozoic strata in the Palen-McCoy-Domerock basin and being shot at in one of our campsites in Arizona, the zinnng of a bullet causing all to scatter from the campfire, diving for cover. Or on my first geology-related helicopter flight—into a canyon in the Pinto Mountains of California on a windy day—when we ran into dead air. I was sitting next to the pilot watching his knuckles turn white as he put the craft into a dive to regain maneuverability and pick up enough airspeed to pull up before we reached the canyon floor...he did. Or camping in an arroyo just barely outside the boundary of the Chocolate Mountains Aerial Gunnery Ranges and having two fighter-bombers come in under 1,000 feet over my lantern, then execute a figure “8” to circle around and come back in over my lantern, this time a few hundred feet. . .while I was hoping very much that the pilots did not think my light was a target flare...they didn’t. And just a few months ago, a UA grad student and I were talking around our campfire at the boundary of Joshua Tree National Park, a few miles from the Eagle Mountain iron mine, when a helicopter approached, descended and circled our camp before landing about 11 p.m. Riverside County sheriffs had flown from Hemet about 100 miles away following up on a report that we might be stealing copper...we weren’t.



**Bob leads a field trip at Joshua Tree National Park**

**What do you consider your greatest professional achievement?** Co-editing GSA Memoir 173 on the evolution of the San Andreas Fault system in southern California and contributing a paper to that volume that presented the first balanced reconstruction of bedrock terranes along the San Andreas and related strike-slip faults. The papers in this volume collectively address inconsistencies in our understanding of the distribution, magnitude, and timing of displacement on various strands of the San Andreas Fault system in relation to central California and to the opening of the Gulf of California. The perspective provided by the geologic mapping behind these studies is used to develop new insight on the plate margin evolution of the San Andreas system.

**How about your greatest achievement EVER?** My wife, Manya, and I raised two daughters to be thoughtful, confident, and caring young adults.

**What are your hobbies?** Travel...seeing new places, learning new things.

**Water, Whiskey or Wine?** Hmm...Water, Whiskey, or Wine? What-about beer?

**We can do that! Thanks, Bob!**

*Do you know someone who would be an interesting subject for a “Member Spotlight” column? Email his/her name and contact information to [ajones@clearcreekassociates.com](mailto:ajones@clearcreekassociates.com).*

## ARIZONA MINING ALLIANCE MEETS

by Alison H. Jones

On August 11, 2011, I attended a meeting of the Arizona Mining Alliance as a representative of AGS. This was the third meeting of the Alliance (my first), which was formed at the request of State Senator Al Melvin to “protect and promote” mining in Arizona. The meeting was led by Steve Trussell, Executive Director of the Arizona Rock Products Association. Representatives of mining companies, equipment companies, and consultants were present, along with a number of elected officials (including Senator Melvin) and others who were running for elected office at the local and state levels.

Mr. Trussell opened the meeting by reminding those in attendance that the purpose of the group was to support the mining industry. He urged anyone who was against mining to leave, as they were at the wrong meeting.

Senator Melvin spoke, backed by a sign that he said he carries with him everywhere. It read, “Jobs are Job #1—Arizona State Legislative Republicans”. He said that Arizona’s “five Cs”, (climate, citrus, cattle, copper, and cotton) are “under relentless attack from the left”, and “Our job is to make sure that Arizona is a safe haven for the five Cs and jobs related to them.”

Rod Pace presented an update on the Rosemont Mine project. He reminded the group that despite the impression created by recent newspaper articles, the Army Corps of Engineers has been involved in the Rosemont project from the beginning. Until the U.S. Forest Service releases the draft Environmental Impact Statement, the Corps does not know what the “preferred alternative” is, and the Corps is thus unable to make any substantive comments about the project at this time.

Lee Allison presented the compelling story of potash in the Holbrook basin of Arizona. Most potash (95%) is used to make fertilizer. There have been no new potash mines in the world in the last 30 years. The US obtains most of its supply from Canada. The USGS estimates there are 7 billion tons of potash reserves in the U.S. and the Holbrook basin reserves are estimated at 600 million to 2 billion tons. The Holbrook basin potash reserves are found at an average depth of 1200 feet, relatively shallow by world standards. With the exploitation of the Holbrook basin reserves, Arizona could be the #1 producing potash state in the nation. Lee reminded the members of the Alliance that his role as State Geologist was to collect and disseminate unbiased, science-based information regarding geology (including mining) to the public and the Governor, to whom he reports.

The Hon. Jim Mack spoke about the Department of Interior’s withdrawal of land in the “Arizona Strip” from mining. The ban on new mining claims on almost one million acres of land in Northern Arizona and Southern Utah was recently extended by six months by the Department of the Interior. An amendment to the Department’s appropriation bill added by Rep Jeff Flake (R-Ariz) would nullify the extension and possibly end the 20-year mining moratorium. Mack urged the group to write to their congressional representatives in support of Arizona Rep. Flake’s amendment.

Finally, Chris DeSimone, host of the radio show “Wake Up Tucson” urged the group to become more politically active as he presented anecdotes about government waste, ineptitude of elected officials, and the unfriendly business environment in the Tucson area.

As a 501-c-3 tax-exempt corporation, AGS is not permitted to engage in lobbying, nor does AGS have an official position on proposed mining projects. This report was prepared as an informational service to the AGS membership. Individual AGS members are welcome to attend these meetings and engage in lobbying if they so choose.

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Seven AGS members rafted through the Grand Canyon from July 10-17. They are (from left to right):

Bob Powell  
Ralph Stegan  
Claudia Stone  
Ben Irvine  
Susan Cummins Miller  
Alison Jones  
Ken Hollett



## 2012 Slate of Nominees—AGS Officers & Councilors

Don't miss the September 6 meeting, when we will vote on the following slate of officers for 2012. Additional nominations will be accepted from the voting membership from the floor during the September meeting. If you are unable to attend the meeting, you may vote electronically on our website ([www.arizonageologicalsoc.org](http://www.arizonageologicalsoc.org)) on or before September 2.

President	Jeffrey Cornoyer, Rosemont Copper Company
VP Programs	Robert J. Kamilli, U. S. Geological Survey
VP Field Trips	Doug Shakel, Retired
VP Marketing	Ann D. Pattison, Independent
Treasurer	Coleen Brown, Retired
Vice Treasurer	Michael Conway, Arizona Geological Survey
Secretary	Alison H. Jones, Clear Creek Associates
Vice Secretary	David F. Briggs, Independent
Past President	Greta J. Orris, U.S. Geological Survey
Councilor 1 (12-14)	Michael Busby, Clear Creek Associates
Councilor 1 (12-14)	Kenneth J. Hollett, Retired, U.S. Geological Survey
Councilor 2 (11-13)	Kim Wilson, Independent
Councilor 2 (11-13)	Robert E. Powell, U.S. Geological Survey
Councilor 3 (10-12)	Corolla K Hoag, SRK Consulting
Councilor 3 (10-12)	Claudia Stone, SRK Consulting

## 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.