

SAN DIEGO ASSOCIATION OF GEOLOGISTS

www.sandiegogeologists.org

SDAG MEETING ANNOUNCEMENT

WEDNESDAY, April 18, 2012

Fossil Curation

Presented by

Steven Byrum Southwestern College

AND

"Fracture Morphology and Orientation Within Saprock and Corestone: Implications for Ground Shaking During Earthquakes on the Elsinore and San Jacinto Faults"

Presented by

Taylor Carrasco San Diego State University

AND

"Rayleigh-Based Multi-Element Coral Paleothermometry: New Developments and Applications"

Presented by

Thomas DeCarlo University of San Diego

- Where: Old Town Mining Company 2543 Congress St., San Diego, 92110 (619) 220-0101
- When: 5:30 pm Social Hour 6:30 pm – Dinner 7:15 pm – Program

Dinner: Choice of:

Teriyaki Steak Kabobs – Two skewers of teriyaki top sirloin steak served with zucchini, yellow squash, mushrooms, red peppers and onions on a bed of rice

Rotisserie Smoked Turkey Dinner – Hand-sliced rotisserie smoked turkey served with stuffing, cranberry sauce, and garlic mashed potatoes

Or

Or

Chicken Picatta Pasta – Tender chicken breast over fettuccini noodles with artichokes, mushrooms, capers, spinach and sundried tomatoes in a creamy white wine sauce

Or

Apple Wood Smoked Chicken Dinner – One-half chicken slow smoked on a mesquite broiler, served with garlic mashed potatoes.

- **Cost:** \$28 per person, \$5 discount for members, STUDENTS: \$15. Add \$5 if you did not make a reservation.
- **Reservations:** Make your reservation <u>online</u> at <u>www.sandiegogeologists.org</u> no later than noon, <u>Monday</u>, April 16th.



RESERVATIONS CANNOT BE GUARANTEED AFTER MONDAY AT 12 NOON BUT THEY ARE ALWAYS PREFERRED OVER WALK-INS.

SPEAKER BIO/ABSTRACTS

Fossil Curation Steven Byrum, Southwestern College

My name is Steven Byrum and I am currently a community college student at Southwestern College. Though still in a community college, I sought to gain firsthand experience in the processes used when working in the field of paleontology. I joined the school's Earth Science Club in 2009, where I learned that my club advisors had been involved in an excavation project in Smuggler's Gulch at the Borderfield State Park. After talking about my interest in the field of paleontology, I was allowed to take a bucket of the material excavated to work on. This eventually led me to the San Diego Natural History Museum where I learned how to use the tools and special techniques needed to prepare and identify the Pliocene age marine fossils contained in the excavated material.

Through one of the school's internship programs I was able to continue working at the San Diego Natural History Museum the following summer. As part of my school requirements, I wrote a paper and developed a Power Point presentation about the preparation process and the fossils that I identified, which included shark teeth and foraminifera.

Afterwards, I gained further knowledge at Anza-Borrego Desert State Park, working both in the field and in the laboratory learning the steps a vertebrate fossil from the region goes through, from discovery to preparation. Through another internship I later learned about the park paleontology society's curation process, from identifying prepared specimens to their entry within a database and storage.

Currently I volunteer at the Natural History Museum working on Pliocene fossils similar to Borderfield. After my studies at Southwestern College, I am hoping to continue my studies in paleontology at UC Berkeley.

"Fracture Morphology and Orientation Within Saprock and Corestone: Implications for Ground Shaking During Earthquakes on the Elsinore and San Jacinto Faults. Taylor Carrasco, San Diego State University

Lying between the Elsinore and San Jacinto faults is a band of precariously balanced rocks first identified by J. Brune and colleagues. Peak accelerations during ground shaking events on the San Jacinto and Elsinore faults were shown by these investigators to reach minimal values about midway between the two faults, and as a result ellipsoidal plutonic blocks (corestones), balanced on narrow pedestals connected to underlying bedrock remain intact, and extend above the land surface. In contrast, closer to the two faults such precariously balanced rocks are generally absent, apparently as a result of them being knocked down during past ground shaking events.

Several recent numerical models show that surrounding large-slip strike-slip fault zones is a large flower-like envelope of damaged rock. Along the fault trace, this zone is generally narrow at depths but then widens significantly when traced to shallower depths reaching up to 10^+ km at the land surface. Work by G.H. Girty, C. Replogle, and M. Maroun has shown that volumetric strains within saprock surrounding corestones at the 7 sites within the band of precariously balanced rocks varies from ~0% to ~+15%. In contrast, at the few locations that have been studied adjacent to the Elsinore fault volumetric strains range from ~26% to ~+38%. In order to evaluate the specific role of fractures

in producing the measured volumetric strains, I have collected oriented blocks at 4 sites and will collect similar data from an additional 4 sites by November 2011. Each collected site is located at different orthogonal distances from the Elsinore or San Jacinto faults. From each block 3 orthogonally oriented thin sections will be or have been made. In each thin section fracture density and fracture porosity will be determined and the mode of fracturing will be evaluated. Preliminary data suggest that the Mode I cracks dominate at the 4 sites that have been so far collected and studied.

Though my analysis of fracture density is not complete, my preliminary observations suggest that fracture density increases toward the Elsinore fault. If preliminary data hold up to additional scrutiny, then my study of fracture density and morphology will support the general idea that ground shaking during earthquakes on the Elsinore and San Jacinto faults can crack saprock and that the intensity of cracking is reflective of volumetric strains. Hence, such measures could be potentially useful in the construction of maps of ground shaking intensity.

"Rayleigh-Based Multi-Element Coral Paleothermometry: New Developments and Applications" Thomas M. DeCarlo, University of San Diego

Our knowledge of ocean climate variability prior to the mid-1800's comes largely from proxy information preserved in marine archives. Annually resolved records that span several centuries, such as those preserved in the skeletons of tropical reef-building corals, are critical to reconstructing the low-frequency oscillations and longer term trends characteristic of the climate of the past millennium. Thermometers based on single element ratio variability are widely used, but in many instances have proven unreliable due to vital effects. Vital effects may yield sea surface temperatures (SSTs) that are several °C too low or too high and cause single element thermometers to produce contradicting SST trends between multiple corals from the same location. We are developing a new thermometer using a Rayleigh-based model of coral biomineralization that uses multiple element ratios and aragoniteseawater partition coefficients to solve for temperature using the Rayleigh equation (Gaetani, Cohen et al. 2011). Here we report advances in the development and application of the RBME thermometer using data generated from corals collected from Palmyra Atoll in the Central Pacific Ocean. We demonstrate that Rayleigh based multi-element thermometry can produce accurate paleo- temperatures without calibration to instrumental temperatures from coral skeletons by accounting for influences upon measured element ratios from a Rayleigh distillation process, temperature and calcification rate. Further, we demonstrate how the RBME approach can be used to identify stress responses in corals experiencing thermal anomalies associated with El Nino events.

Gaetani, G. A., A. L. Cohen, et al. (2011). "Rayleigh-Based, Multi-Element Coral Thermometry: a Biomineralization Approach to Developing Climate Proxies." Geochimica et cosmochimica acta.

2012 SDAG MEETING SCHEDULE - Mark your Calendars!

Meetings are usually on the 3rd Wednesday of the month but may change to accommodate speaker and meeting place schedules. Check here for updates!

May 16, 2012	Dr. Bethany O'Shea, University of San Diego: "Arsenic-mineral interaction in groundwater environments"
June 2012	Joint Meeting with SCGS, Speaker and Date TBA
July 18, 2012	ТВА

2012 EXECUTIVE COMMITTEE

PRESIDENT – Todd Wirths; Cogstone Resource Management, Inc. Ph: (858) 337-0098; todd@wirths.com <u>VICE PRESIDENT</u> – Cari Gomes; cg7783@yahoo.com <u>TREASURER</u> –Brian J. Olson; FSR Engineering; Ph: (858) 750-9243; bolson@fsrengineering.com <u>SECRETARY</u> – Jennifer Bauer Morton; geologyjen@yahoo.com <u>PUBLICATIONS</u> – Lowell Lindsay; Sunbelt Publications; Ph: (619) 258-4911, x111; fax:(619) 258-4916; <u>llindsay@sunbeltpub.com</u> <u>WEBMASTER</u> – Carolyn Glockhoff; Caro-Lion Enterprises, Ph: (858) 549-3396; <u>carolyn@caro-lion.com</u>

PRESIDENT'S CORNER

If you think you want to go to Picacho State Recreation Area again someday, do so now. The park is still on track for indefinite closure starting July 1, 2012. Recently, the San Diego Union Tribune wrote that "Only a fraction of the 70 California parks originally slated to close this summer because of budget cuts are likely to be shut down, a senior state parks official said Tuesday. Agreements already are in place with federal and local government agencies to keep 11 of the parks operating, and negotiations are under way to rescue about 40 other parks on the list..." (SDU-T, March 27). Well, don't hold your breath. Thus far, Picacho SRA doesn't seem to be on that list. Dave Bloom (2007 SDAG President) was there just last weekend and got the low-down from head ranger Sue Barney, that the status of Picacho SRA remains the same. Plus, the acting district superintendent of the Colorado Desert District of California State Parks said re-opening the park "....would depend on future funding to operate the park and to repair any damage that might have occurred during the closed period" (Yuma Sun, March 30). Indeed, trespassing and vandalism are expected to occur, according a March 17 L.A. Times article. This article additionally states that the "savings" incurred by the State by closing the parks will be insignificant when costs for repairs and effort devoted to the act of closing and re-opening facilities are tallied up. "Vandals and thieves caused \$100,000 in damage at the remote Providence Mountains State Recreation Area in the Mojave Desert within months after it was closed last year, well ahead of most other parks. If that much damage were incurred at each of the 60 parks or so still slated for closure, the state would lose \$6 million -- more than half what it proposes to save [\$11 million] -- as well as the sales tax it wouldn't collect from tourists visiting the parks and spending money in neighboring towns."

What you can do:

1) Go to this great, well-designed website: <u>http://www.friends4picacho.org/index.html</u>, the Friends4Picacho advocacy group. Sign up to become a member; the organizers will "...send out updates on any new actions needed to save the park, as well as gather information and resources from our members." The organization is backed by the park's rangers and explains how to donate time and funds.

2) Write letters to our state and federal representatives. Picacho lies within the State's 40th District, represented by Senator Juan Vargas (1224 State Street, Suite D, El Centro, CA 92243), and within the fed's 51st District, represented by Bob Filner (333 F Street, Suite A, Chula Vista, CA 91910). Write letters to them (as recommended by Friends4Picacho) explaining your displeasure with the upcoming closure, your fear of vandalism and destruction of park resources and facilities, that the significant short-term savings the State might make by closing the park will likely not be realized due to the potential costs required for closure effort, vandalism repairs, periodic patrolling by park officials...

3) Go visit the park! Pay the entry fee – could it be any cheaper? – and enjoy what the area has to offer. The rangers - Sue Barney, Robin Greene, and Georgia - are great and will lend advice on how to get involved. I'll be going out there with my family later this month or next, please contact me to schedule and we can check out the sights together (except April 28-29). We're thinking of bringing one of our stand-up paddle boards to float into the river! And I'll be bringing a bottle of good tequila.

4) Help promote the guidebook that SDAG just published, *Picacho and the Cargo Muchachos*. Lowell Lindsay and I can only do so much, and it's all new to me.

Thanks! Todd Wirths



Rojo Grande, Picacho SRA, in the late afternoon (by Izzy Tihanyi)

ANNOUNCEMENTS

Save the Date! September 8-9, 2012 SAN DIEGO ASSOCIATION OF GEOLOGISTS Field Trip - Waiting for Tsunami: Coastal Processes and Geologic Hazards of North San Diego County



In this trip, we will explore the southern California coastline from La Jolla north to San Clemente. We will tour sites of geologic interest including: tsunami features, active coastal erosion, landslides, a Miocene volcanic plug, estuaries, and efforts to restore brackish water areas.

SDSU DEPARTMENT OF GEOLOGICAL SCIENCES ANNUAL BANQUET

Date:	April 13, 2012	
Time:	Social Hour – 6:00 pm	
	Dinner – 7:00 pm	
Location:	Holiday Inn Mission Valley Stadium	
	3805 Murphy Canyon Road, San Diego	
	858-278-9300	-
Cost:	Alumni, Faculty, Guests	\$40
	Current Students/Youngsters	\$20
Contact:	Sue, sdsugeoalum@att.net or 619	-442-8022, for more information

Scripps Institution of Oceanography Roger Revelle Commemorative Lecture April 17th, 4 pm

"Tsunamis: Are We Underestimating the Risk?" - Eddie Bernard, the former director of the National Oceanic and Atmospheric Administration's Pacific Tsunami Warning Center, is scheduled to deliver a lecture titled "Tsunamis: Are we underestimating the risk?" at 4 p.m. April 17 at Scripps Institution of Oceanography. The event is free and open to the public. Bernard's presentation will be the 13th annual Roger Revelle Commemorative Lecture, a series created to honor the late scientist who was director of Scripps Institution of Oceanography from 1951 to 1964 and widely considered the "father" of UC San Diego. Bernard, an affiliate professor at the University of Washington, spent 40 years with NOAA before retiring in 2010. The lecture will be at the Robert Paine Scripps Forum for Science, Society and the Environment (Scripps Seaside Forum), 8610 Kennel Way, just north of El Paseo Grande on the Scripps campus in La Jolla.

Seismological Society of America 2012 Annual Meeting & Town Hall Meeting April 17th, 7:30-9pm

"Earthquake and Tsunami Hazards for the San Diego Region" is the topic of this year's Town Hall Meeting to be held 7:30 - 9:00 PM Tuesday, April 17, 2012 in the Town and Country Room at the Town and Country Resort in Mission Valley. Speakers and Discussion Panel members include Tom Rockwell and Kim Olsen, professors at San Diego State University, Pat Abbott, emeritus professor at SDSU, and Mark Legg of Legg Geophysical in Huntington Beach. This Town Hall evening meeting will be open to the public for the purpose of informing the general population and public officials about earthquake-related issues. For the SSA Annual meeting registration and program information go to: http://www.seismosoc.org/meetings/2012

Plan to share your research with a presentation or a poster 2012 Desert Symposium

Presentation Theme: Life in the Desert: Adaptations to Environmental Extremes
Field Trip Theme: Search for the Pliocene: Southern Exposures
Desert Studies Center, Field Trip April 21- 23, 2012 Zzyzx, California Additional information to follow. Please forward this information to other interested individuals and invite them to send their email addresses to wpresch@fullerton.edu. California State University, Fullerton

Tough Mudder - Looking for a few hardy geologists (or engineers!) interested in competing as a team at this year's Tough Mudder event, at the Snow Valley Mountain ski resort near Big Bear on the weekend of July 7th/8th. If anyone's interested in 12 miles of pain and suffering followed by unlimited cold beer, then please e-mail Rupert Adams at rupert.hgi@sbcglobal.net. For more info, check out http://www.toughmudder.com

Google Earth and Geology - For those of you who attended last November's field trip to Picacho, remember Gary Girty's impressive 7-foot long geology map? You can download it as a kml file here: http://www.geology.sdsu.edu/kmlgeology/.

Speaking of Google Earth, if you liked the article/road log "Barney Oldfield" in *Picacho and the Cargo Muchachos*, Todd Wirths would be happy to provide the kml file for the Cactus Derby Race route- it's fun to fly through the Cargo Muchacho Mountains!

Geology Books - Todd Wirths found a great website for book lovers and geologists: 2Neat Books, http://www.woodenski.com/. They "specialize in out-of-print geology, mineralogy, hydrology, paleontology books, papers, bulletins, journals and more from around the world." Very impressive collection, worth checking out ("woodenski" is the website operator's name).

SPEAKERS WANTED!

Please contact your president, Todd Wirths, for suggestions and leads on potential speakers for our meetings.

26th ANNUAL SDSU GEOLOGY ALUMNI FIELD TRIP April 28 & 29, 2012

The 26th Annual SDSU Geology Alumni Field Trip/Campout will be in the Barstow area this year. A hike up Owl Canyon from the campground on Saturday morning to see the local stratigraphy (about 9:30ish) and a drive/walk through Rainbow Basin geology in the afternoon will be the day's focus. Sunday will be an option to explore Calico Ghost Town, about 15 miles away and/or if you are into Archeology, the Calico Early Man Site is about 25 miles away. Or there is the possibility of doing a "Geocaching" exercise or some 4-W drive trails above Calico for those so inclined. We will be camping in the Owl Canyon BLM Campground with limited water, pit toilets and BBQ grills & fire rings in each site but no trailer hook-ups. There are also swing sets for the kids! There should be someone in the campground from Friday afternoon thru Monday morning depending on the weather forecast. Temperatures will probably be between 52 and 77 with a constant breeze according to the locals.... Campground fees are \$6.00 per site per night with at least 2 vehicles per site, and \$3.00 per site with the Golden Age Passport or Senior Pass so we will be able to get somewhat of a break on price by sharing sites among our Alumni friends. Rainbow Basin is a desert environment so bring sufficient water, food, clothing, equipment, first aid supplies, firewood and refreshments for your activities.

DIRECTIONS: to the Owl Canyon Campground: GPS Coordinates (35.021429 Lat. 117.021751 Long). From the Slauson Cut-Off take any freeway to the I-15 northbound thru the Cajon Pass to Barstow. From the intersection of Barstow Rd. and I-15 go northbound on I-15 about 5 miles to Ft. Irwin Rd. exit. At stop sign turn left (north) and go about 7 miles until you reach "Irwin Rd." on left. There will be a yellow sign indicating T-intersection to left. Turn left onto "Irwin Rd." and go about 4.2 miles to "Fossil Bed Rd." and make a right turn onto Fossil Bed Rd., a bumpy gravel road. Continue another 3 miles to turnoff to "Owl Canyon Campground" on right. Don't miss turn to Campground or you will accidentally be forced to drive thru Rainbow Basin which is a "One Way" road and you will have to make a big loop to return to campground. Look for SDSU Geology signs somewhere in Campground. No reservations can be made, sites are taken on a "First Come First Get" basis so if you think you will be coming out and want to be sure of having a space let me know and I will see what I can do when I get there Friday.

<u>COMMUNICATIONS</u>: FRS Radios channel 4, no tones, just ask for the SDSU Geology Group. Remember that FRS Radios have limited range.... Amateur Radios use Barstow Repeater, 147.180 + pl = 151.4 or, 2-M Simplex 146.520 as you get close. Sorry Jerry no CB this time. I did not check phone service while I was there so what you get may be nothing! <u>FUEL/SERVICES/SUPPLIES</u>: There are stores and fuel in Victorville and Barstow. The "Lenwood" exit about 5 miles south of Barstow has Outlet Malls and fuel, fast food, etc. If you can't find what you need there, and have missed Victorville, then you will have to stop in downtown Barstow. If any of our Alumni are interested in becoming involved with any of our Alumni Activities, like to assist with future Field Trips or has a "Special Place" in mind that would be good for a future Field Trip please let me know. If you have any questions regarding this trip, email or call me.

Joe Corones, Alumni Field Trip Chairman jcorones@gmail.com H 858.484.3582, C 858.603.5545

SEEKING JOB OPPORTUNITIES

Qualifications Summary and Objective: I have 14 years experience directing surface water quality monitoring programs with a proven record of excelling in monitoring plan implementation, quality control, public notification and continuous improvement in operational effectiveness and efficiency. I have built and maintained relationships with key staff in academia, industry, and all levels of government in San Diego and California. I have a widely applicable skill set which includes: analytical thinking, communication and writing skills, data analysis and management, inter and intra- agency project coordination, and staff supervision and training. My objective is to obtain a career position with an industry leader where I can contribute my skills to build the success of my employer as well grow professionally. Detailed work experience, education and more at <u>www.linkedin.com/in/cbclifton2010</u>. Email <u>cbc2006@cox.net</u> or 619-964-1776. Contact: Clay Clifton

ENGINEERING GEOLOGIST- California PG, MS Geology, over 13 years of applied geotechnical experience, proficient in geotechnical investigations, hazard evaluations, geophysical surveys, construction management and quality control, engineering analyses, special interest in earthquake-hazard and seismic design related applications, strong problem-solving and organizational skills. Detailed resume upon request: Anna, 201-407-7461, Afyodorova103@gmail.com

JOB OPENINGS!

Hargis + **Associates, Inc** is looking for a motivated entry level hydrogeologist with relevant course work in hydrogeology, geochemistry, and environmental sciences to join our San Diego office. <u>http://www.hargis.com/jobs-hydrogeologist.html</u>. We are also seeking an engineer with extensive experience in the mining industry for a position in our Tucson office. This position is well suited to a self starting individual with strong ambitions for success and promotion within Hargis + Associates. <u>http://www.hargis.com/jobs-senior-staff-engineer-mining.html</u>.

Seeking a Vice President Environmental Services (VPES) Seeking a successful VPES (seller/doer) to help grow an environmental consulting company in San Diego, CA. The main focus is new client sales and client retention. Other duties will include technical direction and management for client projects. The primary focus for sales and technical project management are in the areas of air quality, CEQA permitting, water discharge, stormwater permitting, regulatory compliance, hazardous materials and waste management, and environmental mitigation management. 5+ years of experience, minimum Bachelor's Degree, and the ability to bring in and retain a large book of business is required. Candidates from the Orange County. CA. area will also be considered. Inquiries and resumes to: resumes@proconnectweb.com

Part-time teaching positions at Palomar College: Geology

The Geology Program at Palomar College is seeking qualified individuals to teach Basic Geology (GEOL 100) Lecture and Basic Geology Lab (GEOL 100L) beginning in the Fall 2012 semester. These courses are introductory in nature; both fulfill general education requirements and requirements for the Geology AA degree. Qualifications for teaching GEOL 100 Lecture and GEOL 100 Lab include a MS degree or higher in geology, geophysics, or the equivalent.

Palomar College is an accredited California Community College that serves more than 30,000 students and is located in San Marcos, California with an education center in Escondido. More information about Palomar College and the Geology Program can be found at <u>http://www.palomar.edu</u>. Interested parties

Sealaska Environmental Services, LLC (SES) is seeking a motivated individual with relevant environmental experience as a Project Manager, to perform all functions in managing projects under U.S. government contracts requiring environmental remedies at various governmental sites, primarily in California. This position is for our San Diego office. The <u>minimum</u> qualifications are:

- Undergraduate degree in engineering or physical science;
- A minimum of six (6) years environmental project management experience, including three (3) years of experience managing remediation projects; and
- Registered professional engineer or registered geologist in the state of California.

The Project Managers' duties and responsibilities are described at the SES website:

http://tbe.taleo.net/NA11/ats/careers/requisition.jsp?org=SEALASKA&cws=1&rid=491

Civil Engineer -TerraCosta Consulting Group is a 25-year specialty design firm providing services in two basic areas: earth retention & foundation design systems; and coastal and maritime engineering.

We are looking for a civil engineer with a geotechnical background, 3 to 5 years experience, and City of San Diego certification in concrete inspection, reinforced concrete inspection, and deep foundation/tieback inspection. Our immediate need is for a field engineer to implement geotechnical design recommendations in the field on construction projects, and perform in-office design work. Ample opportunity exists for career enhancement and growth in the areas of project design and project management. Some travel required.

Minimum Bachelors Degree in Civil Engineering (preferably with geotechnical emphasis) required. Professional registration preferred.

This is a full-time position with great benefits (401k, health, etc.). Salary commensurate with experience.

Email resume and salary requirements to: <u>employment@terracosta.com</u> No calls please!

Geology in the News

Mars-Bound NASA Rover Carries Coin for Camera Checkup

The full version of this story with accompanying images is at:

http://www.kintera.org/TR.asp?a=buLPI8MWLpJXL5NWE&s=foIEJMPtEaKELSNEE&m=gpJMKPPtH 8IFJ1J

The camera at the end of the robotic arm on NASA's Mars rover Curiosity has its own calibration target, a smartphone-size plaque that looks like an eye chart supplemented with color chips and an attached penny.

When Curiosity lands on Mars in August, researchers will use this calibration target to test performance of the rover's Mars Hand Lens Imager, or MAHLI. MAHLI's close-up inspections of Martian rocks and soil will show details so tiny, the calibration target includes reference lines finer than a human hair. This camera is not limited to close-ups, though. It can focus on any target from about a finger's-width away to the horizon.

Curiosity, the rover of NASA's Mars Science Laboratory mission, also carries four other science cameras and a dozen black-and-white engineering cameras, plus other research instruments. The spacecraft, launched Nov. 26, 2011, will deliver Curiosity to a landing site inside Mars' Gale Crater in August to begin a two-year investigation of whether that area has ever offered an environment favorable for microbial life.

The "hand lens" in MAHLI's name refers to field geologists' practice of carrying a hand lens for close inspection of rocks they find. When shooting photos in the field, geologists use various calibration methods.

"When a geologist takes pictures of rock outcrops she is studying, she wants an object of known scale in the photographs," said MAHLI Principal Investigator Ken Edgett, of Malin Space Science Systems, San Diego. "If it is a whole cliff face, she'll ask a person to stand in the shot. If it is a view from a meter or so away, she might use a rock hammer. If it is a close-up, as the MAHLI can take, she might pull something small out of her pocket. Like a penny."

Edgett bought the special penny that's aboard Curiosity with funds from his own pocket. It is a 1909 "VDB" cent, from the first year Lincoln pennies were minted, the centennial of Abraham Lincoln's birth, with the VDB initials of the coin's designer – Victor David Brenner -- on the reverse.

"The penny is on the MAHLI calibration target as a tip of the hat to geologists' informal practice of placing a coin or other object of known scale in their photographs. A more formal practice is to use an object with scale marked in millimeters, centimeters or meters," Edgett said. "Of course, this penny can't be moved around and placed in MAHLI images; it stays affixed to the rover."

The middle of the target offers a marked scale of black bars in a range of labeled sizes. While the scale will not appear in photos MAHLI takes of Martian rocks, knowing the distance from the camera to a rock target will allow scientists to correlate calibration images to each investigation image.

Another part of MAHLI's calibration target displays six patches of pigmented silicone as aids for interpreting color and brightness in images. Five of them -- red, green, blue, 40-percent gray and 60-percent gray -- are spares from targets on NASA Mars rovers Spirit and Opportunity. The sixth, with a fluorescent pigment that glows red when exposed to ultraviolet light, allows checking of an ultraviolet light source on MAHLI. The fluorescent material was donated to the MAHLI team by Spectra Systems,

Inc., Providence, R.I.

A stair-stepped area at the bottom of the target, plus the penny, help with three-dimensional calibration using known surface shapes.

Curiosity also carries calibration materials for other science instruments on the rover. "The importance of calibration is to allow data acquired on Mars to be compared reliably to data acquired on Earth," said Mars Science Laboratory Project Scientist John Grotzinger, of the California Institute of Technology, Pasadena.

The MAHLI calibration target, with its penny and a miniscule cartoon of a character named "Joe the Martian," serves an additional function: public engagement.

"Everyone in the United States can recognize the penny and immediately know how big it is, and can compare that with the rover hardware and Mars materials in the same image," Edgett said. "The public can watch for changes in the penny over the long term on Mars. Will it change color? Will it corrode? Will it get pitted by windblown sand?"

The Joe the Martian character appeared regularly in a children's science periodical, "Red Planet Connection," when Edgett directed the Mars outreach program at Arizona State University, Tempe, in the 1990s. Joe was created earlier, as part of Edgett's schoolwork when he was 9 years old and NASA's Mars Viking missions, launched in 1975, were inspiring him to dream of becoming a Mars researcher.

Edgett said, "The Joe the Martian on Curiosity really is a 'thank you' from the MAHLI team to the folks who have provided us with the opportunity to study Mars, the U.S. taxpayers. He is also there to encourage children around the world to set goals that will help them achieve their dreams in whatever interests they pursue."

The Mars Science Laboratory is managed by NASA's Jet Propulsion Laboratory, a division of the Caltech. For more information, visit <u>http://www.nasa.gov/msl</u>.

Request for Sponsors: 2012 SDAG/SDGS and Publication SPONSORS

On behalf of the San Diego Geological Society, Inc. (SDGS), a public benefit 501(c)3 nonprofit educational corporation, we would like to request tax deductible Donations at our San Diego Association of Geologists (SDAG). The list of paid Sponsors and the forms to become a Sponsor are located on the SDAG web site at: http://www.sandiegogeologists.org/Sponsors.html. Your donation will further the SDGS mission to promote geology and related fields in the greater San Diego region, operating through the San Diego Association of Geologists (SDAG), a committee of SDGS. To achieve our primary educational objective, we organize frequent field trips and maintain a program of monthly meetings featuring speakers on current geological topics. We also publish field trip guidebooks and other publications related to geology and natural history. We encourage scholarship and research by awarding scholarships from the elementary through graduate levels. With your \$100 "EMERALD" donation, your name/business will be listed as a sponsor on the SDAG web site (http://www.sandiegogeologists.org/) and in the monthly SDAG meeting newsletters. With your \$500 "RUBY" or \$1,000 or more "DIAMOND" level donation, your business card will also be included on the SDAG web site and in the monthly SDAG meeting newsletters. In addition, as a "\$1,000 or more DIAMOND" level donation you will be presented with a thank you plaque. Should you have any questions regarding a Sponsorship, please contact our non-profit SDGS Secretary (Diane Murbach) at 619-865-4333

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Geochemistry Inc.

Contact: Louise Adams or Suzie Reed



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Contact: Dave Bloom



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