

# NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



Website: [www.ncgeolsoc.org](http://www.ncgeolsoc.org)

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## MEETING ANNOUNCEMENT

**DATE:** October 27, 2010

**LOCATION:** Orinda Masonic Center, 9 Altarinda Rd., Orinda

**TIME:** 6:30 p.m. social; 7:00 p.m. talk (no dinner) Cost:  
\$5 per regular member; \$1 per student or K – 12  
teachers

**SPEAKER:** Dr. Geoffrey W. Marcy; Professor of  
Astronomy, University of California,  
Berkeley

### *Searching for Other Earths and Life in the Universe*

Science fiction assumes that our Milky Way Galaxy abounds with habitable planets populated by advanced civilizations engaged in interstellar commerce and conflict. Back in our real universe, Earth-like planets and alien life have proved elusive. Has science fiction led us astray? Last year astronomers launched the first searches for Earth-like worlds around other stars, using remarkable telescopes for the task. These telescopes fundamentally supersede Galileo's historic little scope for the first time. A race for signs of inhabited worlds and extraterrestrial life is underway using modern, technical underpinnings.

**Biography:** Dr. Geoff Marcy is a Professor of Astronomy at UC Berkeley and an Adjunct Professor of Physics and Astronomy at San Francisco State University. He is the Director of Berkeley's "Center for Integrative Planetary Science", a research unit designed to study the formation, geophysics, chemistry and evolution of planets. He is an elected member of the National Academy of Sciences and has been the recipient of numerous awards, including the NASA Medal for Exceptional Scientific Achievement. He was named Discovery Magazine's Space Scientist of the Year in 2003. He was also co-recipient of the prestigious Shaw Prize. He received his PhD in 1982 from UC Santa Cruz.

Geoff is one of the pioneers and leaders in the discovery and characterization of planets around other stars. He and his collaborators have discovered nearly half of the 450 known exoplanets. They found the first system of multiple planets around a normal (main sequence) star, and also found the first Saturn-mass planet and the first Neptune-like planet. They also found the first transiting planet (a co-discovery with T. Brown and D. Charbonneau). His group is now searching for Earth-like planets using NASA's Kepler Mission and the Keck telescope in Hawaii.

## NCGS 2010 – 2011 Calendar

### Wednesday November 17, 2010 (Early Date!)

Philip Johnson, Cotton Shires & Associates, Los Gatos; *Laramide Orogeny in the Green River Basin*

7:00 pm at Orinda Masonic Lodge

### Our Normal December Break

### Wednesday January 26, 2011

Dr. John Parrish, State Geologist, California Geological Survey; *California Geological Survey - Staying Relevant After 150 Years*

7:00 pm at Orinda Masonic Lodge

### Wednesday February 23, 2011

TBA

7:00 pm at Orinda Masonic Lodge

### Wednesday March 30, 2011

TBA

7:00 pm at Orinda Masonic Lodge

### Wednesday April 27, 2011

TBA

7:00 pm at Orinda Masonic Lodge

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## Upcoming NCGS Events

November 13, 2010	The Geology of the Abandoned Mt. Diablo Mine; Joe Lovenitti & Paul Horton, with Fredrick Ousey & Edward Hamilton
March / April 2011	Geology of the Iron Mountain Mine Superfund Site, Redding, CA
Early 2011	Cantua Creek II; Dr. Mel Erskine
June 25 & 26, 2011	Geology of Lake Tahoe Region, Dr. Rich Schweickert, Emeritus, University of Nevada, Reno

Do you have a place you've wanted to visit for the geology? Let us know. We're definitely interested in ideas. For those suggestions, or for questions regarding, field trips, please contact Tridib Guha at: [Tridibguha@sbcglobal.net](mailto:Tridibguha@sbcglobal.net)

## Peninsula Geologic Society

### Upcoming meetings

For an updated list of meetings, abstracts, and field trips go to <http://www.diggles.com/pgs/>. The PGS has also posted guidebooks for downloading, as well as photographs from recent field trips at this web address. Please check the website for current details.

- November 9, 2010 – Darcy Ogden, Stanford
- December 7, 2010 - Open
- January 11, 2011 - Jessica Oster, Stanford

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## Association of Engineering Geologists

### San Francisco Section

#### Upcoming Events

Meeting locations rotate between San Francisco, the East Bay, and the South Bay. Please check the website for current details:

- November 18, 2010 Joint ASCE / AEG Meeting; TBA

To download meeting details and registration form go to: <http://www.aegsf.org/>.

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## USGS Evening Public Lecture Series

The USGS Evening Public Lecture Series events are free and are intended for a general public audience that may not be familiar with the science being discussed. Monthly lectures are usually scheduled for the last Thursday evening of each month during most of the year but are occasionally presented on the preceding Thursday evening to accommodate the speakers. For more information on the lectures, including a map of the lecture location (Building 3, 2nd floor; Conference Room A) go to: <http://online.wr.usgs.gov/calendar/>

- October 28, 2010; 7 pm; *Dam Removal in the Pacific Northwest*; Jonathan Warrick, Research Geologist
- November 18, 2010; 7 pm; *New Technology in Remote Sensing*; Rian Bogle
- December 9, 2010, 7 pm; *Forecasting Volcanic Eruptions in Alaska*; Stephanie Prejean Alaska
- January 27, 2011, 7 pm; *Geologic Sequestration of Carbon Dioxide: Minimizing Environmental Impacts*; Yousif Kharaka

## A Second Notice - New Payment Policy

At a recent Board meeting the NCGS Board adopted a new policy that will be effective this new academic year (September 2010 to June 2011). In an announcement in the June 2010 newsletter, comments were requested before any changes were to be implemented (to have been directed to **President Mark Sorensen**).

For members who receive our newsletter by regular mail, the Board has reluctantly adopted a new newsletter delivery policy. Printing and mailing each newsletter generally costs the Society \$2.20 to \$2.75, depending on the number of pages (and thus weight). With nine newsletters a year, total newsletter costs per mail newsletter recipient (alone) range between \$19.80 and \$24.75; clearly a money losing proposition. Regrettably, when society insurance (event and officer), meeting hall rental costs, and other administrative costs (website costs and etc.) are factored in, members who receive the newsletter by U.S.P.O. (snail) mail delivery are more heavily subsidized than these numbers suggest. **Consequently a \$10 Snail Mail Surcharge has been approved by the NCGS Board.**

To save funds in this economic period, please consider converting to electronic delivery; it really prints just the same! Additional benefits are the fact that the newsletter is increasingly using color photos that are not as easily viewed in a black and white copy; and direct and fast access to web links that are now a standard feature in the newsletter. However, for diehard fans of hardcopy newsletter delivery, please sign up at the slightly increased rate of \$25 per year. If you're a member of several societies, you know that it's still a bargain at that rate. And please note, with very rare exceptions with other societies, NCGS does not share email addresses. Thanks.

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### Best Blog About East Bay Rocks

*East Bay Express, Best of the East Bay 2010,  
Arts & Culture Section*

#### Oakland Geology

Geo-geek Andrew Alden explores the craggy crannies of Oakland that are invisible to most of us. You might think a blog about rocks would make for some pretty yawn-inducing reading, but Alden succinctly describes headscarps, wacke, and serpentinite with an obvious passion for his chosen field. At times the narrative almost resembles poetry, as when he describes a brown mudstone excavation on Skyline Boulevard: "The dark layer is as creamy as chocolate between the teeth. As I stood there, the rattle of falling pebbles was nearly

constant." Too bad some unlucky soul in the Montclair hills is building a doomed garage atop this shaky foundation. Those who enjoy a daily dose of panic (or reality, depending on your perspective) should peruse the "Oakland hazards" and "Hayward fault" categories. Alden's notes on acid mine drainage, dam failures, forest fires, and the impending Big One make for some hair-raising reading about the Bay Area's shaky state.

#### Footnote:

NCGS member Andrew Alden also maintains the [About.com](#), geology blog site where he covers the earth sciences as the "Geology Guide". He notes in his Oakland geology blog that his home town of Oakland is full of interesting sites and topics, and since he's out and about it a good bit he created the [OaklandGeology.wordpress.com](#) spot to think, observe, and report locally. His "aboutgeology" is also on Twitter.

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### Native American Saltworks -- Oldest Business in North America

USGS News Release: 12/2/2009

Native Americans of the Miwok tribe in the northern Sierra Nevada, Calif., were one of the first groups to move from a hunter-gatherer activity to manufacturing, producing salt for trade.

New U. S. Geological Survey research indicates that more than 350 basins three to four feet in diameter are carved in granite in an area the size of a football field, and that they were intentionally created by this tribe for the purpose of refining salt from a nearby salt spring.

"The water was carried to the individual basins, probably in water-tight baskets, where it dried in the summer heat, leaving a salt residue on the basin floor," said Jim Moore, USGS geologist and co-author of the report. "Such a large enterprise produced far more salt than was needed by the local tribe for cooking, preserving food, and attracting animals for hunting, and they had a large surplus of the valuable item left over for trade with other tribes."

Analysis of the salt content and flow of the water reveal that the spring supplies about three tons of salt each summer. The tribe created just enough basins to exploit virtually all of this salt - about two and a half tons - as determined by the size of the basins and the evaporation rate of the water in the basins. Additionally, the relatively uniform size, lack of overlap, and smooth hemispherical shape indicate that the basins are not of natural origin, as reported in previous work.

Making these basins was challenging and required concerted effort by this group of Native Americans, though the exact techniques used to excavate so many basins in this glaciated bedrock are not known.



*Native Americans of the Miwok tribe in the northern Sierra Nevada, California carved these basins into the granite bedrock to produce salt for trade. They filled the basins with water from a salt spring and let the water evaporate, leaving a salt residue in the basin. The basins are about a meter in diameter and span the area of a football field.*

“Fire was probably used to heat the rock reducing its strength and making it easier to grind,” said Mike Diggles, USGS geologist and co-author of the report. “To deepen the basins just one centimeter, they had to build and maintain a hot fire on the rock, let it burn out, and then pound the bedrock with stone tools.”

The Miwok had to repeat this process about 100 times to carve a basin three feet deep into the stone. It would have taken several workers nearly a year to make just one basin.

The [full report](#), titled *Hand-hewn granite basins at Native American saltworks, Sierra Nevada, California*, was published in the beginning of November.

The site is on land administered by the U.S. Forest Service, which authorized this study. Because of the archeologically sensitive nature of the site, location details are not public, in accordance with U.S. statute: Archeological Resources Protection Act of 1979 (16 U.S.C. 470). The full report focuses on the geologic, not the archeological, perspective.

## Venus Is Geologically Alive, Signs of Recent Lava Flows Suggest

*ScienceDaily* - For the first time, scientists have detected clear signs of recent lava flows on the surface of Venus. The observations reveal that volcanoes on Venus appeared to erupt between a few hundred years to 2.5 million years ago. This suggests the planet may still be geologically active, making Venus one of the few worlds in our solar system that has been volcanically active within the last 3 million years.

The evidence comes from the European Space Agency's Venus Express mission, which has been in orbit around the planet since April 2006. The science results were laid over topographic data from NASA's Magellan spacecraft. Magellan radar-mapped 98 percent of the surface and collected high-resolution gravity data while orbiting Venus from 1990 to 1994.

Scientists see compositional differences compared to the surrounding landscape in three volcanic regions. Relatively young lava flows have been identified by the way they emit infrared radiation. These observations suggest Venus is still capable of volcanic eruptions. The findings appear in the April 8 edition of the journal *Science*.

"The geological history of Venus has long been a mystery," said Sue Smrekar, a scientist at NASA's Jet Propulsion Laboratory in Pasadena, Calif., and lead author of the paper describing the work. "Previous spacecraft gave us hints of volcanic activity, but we didn't know how long ago that occurred. Now we have strong evidence right at the surface for recent eruptions."

The volcanic provinces, or hotspots, on which Smrekar and her team focused are geologically similar to Hawaii. Scientists previously detected plumes of hot rising material deep under Venus' surface. Those plumes are thought to have produced significant volcanic eruptions. Other data from the planet suggest that volatile gases commonly spewed from volcanoes were breaking down in its atmosphere. The rate of volcanism will help scientists determine how the interior of the planet works and how gases emitted during eruptions affect climate.

Something is smoothing Venus' surface, because the planet has only about 1,000 craters, a relatively small amount compared to other bodies in our solar system. Scientists think it may be the result of volcanic activity and want to know if it happens quickly or slowly. The Venus Express results suggest a gradual sequence of smaller volcanic eruptions as opposed to a cataclysmic volcanic episode that resurfaces the entire planet with lava.

Smrekar and her team also discovered that several volcanic features in the regions they studied show evidence of minerals found in recent lava flows. These

mineral processes correspond to the youngest volcanic flows in each region, giving scientists additional support for the idea they formed during recent volcanic activity. On Earth, lava flows react rapidly with oxygen and other elements in the atmosphere when they erupt to the surface. On Venus, the process is similar, although it is more intense and changes the outer layer more substantially.

Scientists call Venus Earth's sister planet because of similarities in size, mass, density and volume. Scientists deduce that both planets shared a common origin, forming at the same time about 4.5 billion years ago. Venus also is the planet on which the runaway greenhouse effect was discovered. The planet is cloaked in a much less friendly atmosphere than that found on Earth. It is composed chiefly of carbon dioxide, which generates a surface temperature hot enough to melt lead, and a surface pressure 90 times greater than that on Earth.

The small group of worlds in our solar system known to be volcanically active today includes Earth and Jupiter's moon Io. Crater counts on Mars also have suggested recent lava flows. Scientists are studying evidence of another kind of active volcanism that involves ice-spewing volcanoes on other moons in our solar system.

NASA sponsored Smrekar's research. The European Space Agency built and manages Venus Express. JPL is managed for NASA by the California Institute of Technology in Pasadena. To view the spacecraft data and images, visit:

<http://www.nasa.gov/topics/solarsystem/features/pia13001.html>.

**Journal Reference:** Suzanne E. Smrekar, Ellen R. Stofan, Nils Mueller, Allan Treiman, Linda Elkins-Tanton, Joern Helbert, Giuseppe Piccioni, and Pierre Drossart. **Recent Hot-Spot Volcanism on Venus from VIRTIS Emissivity Data.** *Science*, 2010

## Egyptian Desert Expedition Confirms Spectacular Meteorite

### Impact

*ScienceDaily (Sep. 27, 2010)* — A 2008 Google Earth search led to the discovery of Kamil crater, one of the best-preserved meteorite impact sites ever found. Earlier this year, a gritty, sand-blown expedition reached the site deep in the Egyptian desert to collect iron debris and determine the crater's age and origins.

One day within the last several thousand years, a rare metallic meteorite traveling over 12,000 km/hour smashed into Earth's surface near what is today the trackless border region between Egypt, Sudan and Libya. The impact of the 1.3 m, 10-tonne chunk of iron generated a fireball and plume that would have been visible over 1000 km away, and drilled a hole 16 m deep and 45 m wide into the rocky terrain. Since then, the crater had sat undisturbed by Earth's geologic and

climatic processes, which usually render all but the very largest terrestrial impact craters invisible. It was also, as far as is recorded, unseen by humans.

### Searching for craters in Google Earth

But that changed in 2008, when the crater was spotted during a Google Earth study conducted by mineralogist Vincenzo De Michele, then with the Civico Museo di Storia Naturale in Milan, Italy. He was searching for natural features, when by chance he saw the rounded impact crater on his PC screen. De Michele contacted an astrophysicist, Dr Mario Di Martino, at the INAF (National Institute for Astrophysics) observatory in Turin, who, together with Dr Luigi Folco, of Siena's Museo Nazionale dell'Antartide, organised an expedition to the site in February this year. It took over a year to plan and obtain permissions for the journey; in the meantime, and in collaboration with Telespazio, e-Geos and the Italian space agency ASI, the Kamil region was analysed using satellite data and in particular high-resolution radar images provided by the ASI-operated COSMO-SkyMed satellite constellation.



*Using ground-penetrating radar to study the impact crater. (Credit: L. Folco/The Kamillers)*

### Expedition to the Egyptian desert

The two-week, 40-person expedition included Egyptian and Italian scientists, as well as numerous local support workers, and was conducted as part of the 2009 Italian-Egyptian Year of Science and Technology (EISY). It was also supported with funding by ESA's Space Situational Awareness (SSA) program.

### Three-day drive to reach Kamil crater

After a tiring, GPS-guided, three-day drive across the desert in 40°C heat, the team reached the crater. They collected over 1000 kg of metallic meteorite fragments, including one 83-kg chunk thought to have split from the main meteorite body shortly before impact (it was found 200 m away from the crater). The joint team also conducted a thorough geological and topographical survey, using ground-penetrating radar to create a 3D

digital terrain model. Geomagnetic and seismic surveys were also carried out.

### Ground truth for small-scale impact craters

The researchers were stunned to find that Kamil crater, named after a nearby rocky outcrop, remains pristine, and must have been created relatively recently. "This demonstrates that metallic meteorites having a mass on the order of 10 tonnes do not break up in the atmosphere, and instead explode when they reach the ground and produce a crater," says ESA's Dr Detlef Koschny, Head of Near Earth Objects segment for the SSA program. Kamil crater has become the target of intense interest for geologists, astrophysicists and even archaeologists. "We are still determining the geochronology of the impact site, but the crater is certainly less than ten thousand years old -- and potentially less than a few thousand. The impact may even have been observed by humans, and archaeological investigations at nearby ancient settlements may help fix the date," says Dr Folco.

The data gathered during the expedition will be very useful to ESA's SSA activities for risk assessment of small asteroids with orbits that approach Earth, a category to which the Kamil impactor originally belonged.

(Reprinted with editorial adaptations by ScienceDaily staff from materials provided by the European Space Agency).

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## Dead Fish Tell Evolutionary Tales

by Phil Berardelli on 12 October 2010, 7:03 PM |

Talk about suffering for a noble cause. A group of paleontologists at the University of Leicester in the United Kingdom spent almost every day for more than 6 months watching fish rot in an attempt to find patterns in their decay. The results show that a body's soft tissues deteriorate in a consistent and predictable way. The findings, experts say, could greatly improve our understanding of evolution by helping researchers better interpret the fossil record.

We know what we know about extinct vertebrates almost entirely because of the mineralization of their bones. Over thousands of years, the calcium phosphate in an animal's skeleton combines with other minerals in the ground, forming fossils that can survive for hundreds of millions of years. But bones tell only a small part of the story, because the body of a vertebrate consists mostly of soft tissues—skin, muscles, nerves, and the like—that decay quickly.

In some cases, researchers can deduce specifics of an extinct animal's soft tissues by comparing them with those of living creatures. Recently, for example, researchers studied the bone joints of dinosaurs and those of modern-day birds and reptiles and concluded that some dinosaurs must have sported much thicker-

than-expected pads of [cartilage](#) in their joints. Therefore, some dinosaurs must have stood a little taller than they've been depicted in museum exhibits. Such anatomical details are often lost to paleontology.

Soft tissues are even more important in the most primitive vertebrates because they show the subtle and complex changes that occurred as this group emerged, says lead author Robert Sansom, who collected lamprey specimens for the study from streams in the United Kingdom and hagfish from fjords in Sweden. He says the research team chose the two species because they are among the most primitive forms of fish, so they can provide more clues about the bodies of their long-dead ancestors.

Sansom and colleagues Sarah Gabbott and Mark Purnell spent 200 days observing the decomposition of the fish carcasses and documenting which body parts disappeared in what order. Despite ventilating fans, industrial deodorizers, and breathing masks, he says, "the stench was pretty pungent." And although Sansom says he has grown accustomed to the environment, "I do not get many visitors to the lab."

The hardship seems to have been worth it. From their observations, the researchers were able to detail what they call a largely unknown "decay bias." That is, Sansom explains, the later-evolved parts of the body are lost soonest. In lampreys, for example, certain parts of the brain and the mouth that distinguish the animals from earlier relatives begin a rapid decay within 24 hours. Those missing structures, says Sansom, can cause researchers to misinterpret fossil organisms "as more primitive than they would have been in life," something that potentially skews evolutionary history.

With the new results, researchers can compare the presence or absence of features preserved in fossils with the decay patterns in the present-day specimens. In fossils that preserve only characteristics known to be decay resistant, it's possible that some evolutionary features "could be missing due to decay," Purnell says. If so, scientists could "lack the information to interpret that fossil correctly." The team will [publish](#) its aromatic results online tomorrow in the *Proceedings of the Royal Society B*.

The study provides "important constraints on the interpretation of rare fossils, including some of our earliest ancestors," writes paleobiologist Derek Briggs of Yale University's Peabody Museum of Natural History in an e-mail. The results with decaying fish, he adds, "can be applied to the interpretation of soft-bodied fossils in general, and particularly to determining their true place in the tree of life."

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**Again as usual of late, the editor sincerely thanks John Christian for suggesting more than several of these articles for the newsletter! Please thank him for spotting some of these gems!**

# NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



## 2010-2011 COLLEGIATE SCHOLARSHIP PROGRAM

The Northern California Geological Society is pleased to announce the availability of scholarships for undergraduate and graduate students for the 2010-2011 Academic Year as follows:

### Undergraduate Scholarship Awards of \$ 500

Funding is for seniors working toward completion of a Senior Thesis and/or Honors Research Program. Funding is provided for projects implemented during the 2010-2011 Academic Year. Application deadline is November 1, 2010 with an award date on or about December 10, 2010.

### The Richard Chambers Memorial Scholarships for Graduate Degree Programs

**\$ 1,000 scholarships for students working toward the Masters Degree**  
**\$ 2,000 scholarships for students working towards the Doctorate Degree**

Funding is provided for projects scheduled for completion during the 2011 calendar year. Application deadline is December 15, 2010 for an award date on or about January 31, 2011.

Multiple scholarships may be awarded at each academic level.

Funding priorities for these scholarships will be directed towards research focused on topics including general geology, geologic mapping, structural, economic, engineering, and/or environmental geology, geophysics, stratigraphy, paleontology or paleo-ecology, implemented in northern California or states immediately adjacent to northern California. Recipients may be invited to present their research (either lecture or poster) at a regular evening NCGS meeting in Orinda, California.

Individual scholarship announcements with instructions can be found on the Northern California Geological Society's web-site <http://www.ncgeolsoc.org>. They may also be requested from:

Phillip Garbutt, Chair  
NCGS Scholarship Committee  
6372 Boone Drive  
Castro Valley, CA 94552-5077

email: [plgarbutt@comcast.net](mailto:plgarbutt@comcast.net)  
voice: (510) 581-9098

Previous scholarship recipients and their projects may be viewed on the Northern California Geological Society's web-site <http://www.ncgeolsoc.org>

Issued: September 1, 2010

# NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



## “GEOLOGY OF THE ABANDONED MOUNT DIABLO MINE”

**NCGS FIELD TRIP - Saturday November 13, 2010**

**Leaders:** Joe Iovenitti, Alta Rock Energy  
Paul Horton, The Source Group, Inc.  
**Contributors:** Frederick Ousey, EnviroTech  
Edward Hamilton, McCampbell Analytical, Inc.

### ABSTRACT

The Mt Diablo Mine is located about 5 miles southeast of Clayton, California at the northeast base of Mt. Diablo's North Peak. In 1863, cinnabar was discovered here and the first claim was filed in a flurry of prospecting activity that enveloped the Clayton area in the early 1860's. Subsequently, two mines, the Mount Diablo and the Ryne, were producing quicksilver (mercury) from geologically cogenetic deposits of cinnabar and metacinnabar. Only the Mt. Diablo Mine will be visited on this field trip.

The Mt. Diablo Mine is located in a 2,000 foot long lenticular body of silica-carbonate rock and serpentine that strikes northwest and dips 35 to 74 degrees northeast. This body lies in the boundary fault zone separating Franciscan Formation greywacke, with minor chert and shale, on the fault footwall from well-bedded mudstone and sandstone of Cretaceous age, on the hanging wall. The boundary fault surrounds the Franciscan core of Mt. Diablo and defines a more extensive thrust fault sequence that has uplifted subducted oceanic seafloor by a process known as cold intrusion. Tectonic activity along this and other regional faults has formed Mt. Diablo in the last 5 million years. Hydrothermally altered portions of the boundary fault serpentine yield the mineral deposits that enrich this area. The quicksilver formed by hydrothermal alteration of cinnabar and metacinnabar in the silica-rich rock. The Mt. Diablo mine produced both metacinnabar and cinnabar ore for smelting.

The Mt Diablo Mine had a series of owners before operations ceased in the 1950's. At the Mt. Diablo Mine, extensive tunnels and shafts were worked at five levels, or benches, until the area was open pit mined. Presently the quicksilver ore is exposed in open cut seams.

The current owner, Jack Wessman, purchased both the Ryne and the Mt. Diablo Mine properties in 1973, long after the mines had ceased operation. Shortly thereafter, the Mt. Diablo mine site was placed on the priority pollutants list for releasing mercury into the Marsh Creek Watershed. Mr. Wessman has spent a substantial sum of his own money to mitigate the mercury contamination associated with the abandoned mercury mines and their tailings.

In 2008, as part of the Federal Government's, Stimulus Package, Contra Costa County was funded \$517,000 through the Army Corps of Engineers to help curtail mercury release into the watershed. Congressman George Miller's website indicates the Army Corps has completed Phase I of their Technical Planning Process under the Remediation of Abandoned Mine Sites (RAMS) program, and that the funding request will allow completion of the clean-up process.

**THIS FIELD TRIP WILL BE LIMITED TO 30 PEOPLE. Hiking is required. Carpooling is required.**

\*\*\*\*\* **Field Trip Logistics** \*\*\*\*\*

**Time & Departure:** November 13, 2010, 8:30 am (sharp), meeting place will be notified

**Cost:** \$20/person includes, morning coffee and pastries, lunch and a guidebook (no refund for no show)

\*\*\*\*\* **REGISTRATION FORM (Mount Diablo Mine Field Trip)** \*\*\*\*\*

Name: \_\_\_\_\_ E-mail: \_\_\_\_\_  
Address: \_\_\_\_\_ Phone: \_\_\_\_\_ Cell/Alternate: \_\_\_\_\_  
Lunch: Regular: \_\_\_\_\_ Vegetarian: \_\_\_\_\_ (Please check one) Check Amount: \_\_\_\_\_  
Please mail a check made out to **NCGS** to: **Tridib Guha, 5016 Gloucester Lane, Martinez, CA 94553**

Questions: e-mail: [tridibguha@sbcglobal.net](mailto:tridibguha@sbcglobal.net) Phone: (925) 370-0685 (evening) (925) 451-1999 (day)

# NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



## 2010-2011 Renewal Form

Please fill out this form and attach your check made out to NCGS.

Mail to:

Phil Reed  
NCGS Treasurer  
488 Chaucer Circle  
San Ramon, CA 94583-2542

**Dues**

Regular (\$ 15; email only) \$ \_\_\_\_\_  
Regular (\$ 25; snail mail only) \$ \_\_\_\_\_  
Student (\$ 5; email only) \$ \_\_\_\_\_

**Contribution**

Scholarship \$ \_\_\_\_\_  
Teacher Award \$ \_\_\_\_\_

**Total** \$ \_\_\_\_\_

Please provide the following information:

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

E-mail: \_\_\_\_\_

I can help with:

Programs \_\_\_\_\_ Field Trips \_\_\_\_\_ Newsletter \_\_\_\_\_ Web Site \_\_\_\_\_

K-12 Programs \_\_\_\_\_ Scholarships \_\_\_\_\_ AAPG Delegate \_\_\_\_\_ Membership \_\_\_\_\_

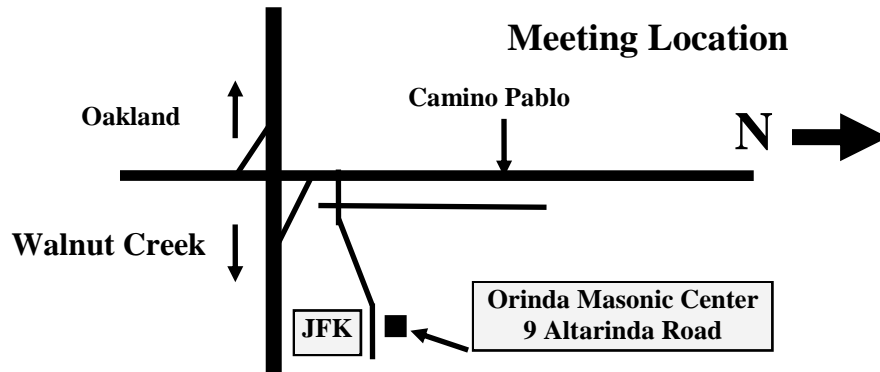
Please complete the following *only* if there are changes since last year:

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Marcy has won several awards including the Shaw Prize (2005, shared with M. Mayor), Discover Magazine Space Scientist of the Year (2003), the NASA Medal for Exceptional Scientific Achievement (2003), California Scientist of the Year (2000), Beatrice Tinsely Prize from the American Astronomical Society (2002), and membership in the U.S. National Academy of Sciences (2002). He did a guest appearance on the David Letterman Late Show (11 April 2001). He has over 400 publications in refereed journals. He loves teaching undergraduates courses at UC Berkeley.

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