

NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



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NOVEMBER MEETING ANNOUNCEMENT

DATE: Wednesday, November 29, 2000

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

TIME: 6:30 p.m. Social; 7:00 p.m. talk (no dinner)
Cost is \$5.00 per person / \$5.00 per family

RESERVATIONS: Leave your name and phone number at 925-294-7530 anytime before the meeting.

BAGS-NCGS Family Night

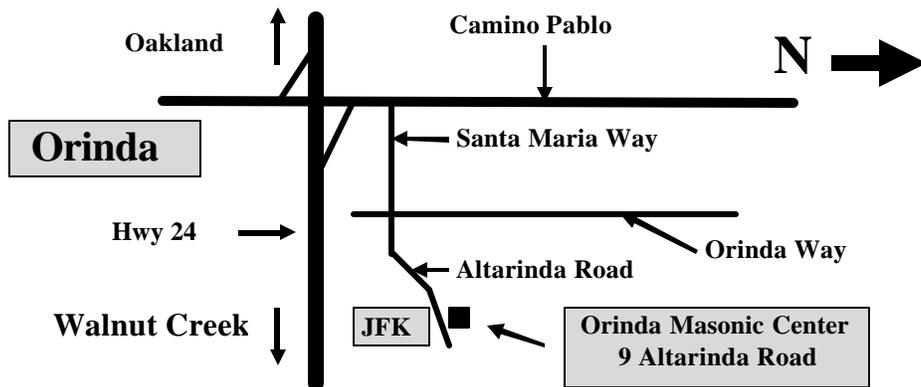
SPEAKER: Dr. Chris McKay, NASA Ames Research Center

Landscape Geomorphology and the Search for Water on Mars: Implications for the Development of Life

Mars appears to be cold dry and dead world. However there is good evidence that early in its history it had liquid water, more active volcanism, and a thicker atmosphere. Mars had this earth-like environment over three and a half billion years ago, during the same time that life appeared on Earth. The main question in the exploration of Mars then is the search for a independent origin of life on that planet. Ecosystems in cold, dry locations on Earth -- such as the Antarctic --- provide examples of how life on Mars might have survived and where to look for fossils.

Dr. Christopher P. McKay is a Planetary Scientist with the Space Science Division of NASA Ames Research Center, Moffett Field, California. Chris received his Ph.D. in AstroGeophysics from the University of Colorado in 1982 and has been a research scientist with the NASA Ames Research Center since that time. His current research focuses on the evolution of the solar system and the origin of life. He is also actively involved in planning for future Mars missions including human settlements. Chris has been involved with polar research since 1980, traveling to the Antarctic dry valleys and more recently to the Siberian and Canadian Arctic to conduct research in these Mars-like environments.

(Map to the Orinda Masonic Center is on the back of the newsletter)



NCGS Bits and Pieces

The NCGS wishes to extend a warm welcome the following new members:

Rolf Erickson
Roger Griggs

Jay Hubert
Allan Martini

Larry Pytlik

The society hopes to see these new faces at future NCGS events!

Past President **Don Lewis** has informed us that the **NCGS coffee mugs** have arrived! Don will be selling the cups at future monthly meeting for **\$5.00** each. These will also be given as a gift to speakers at our meetings.

K-12 Program Chair **Aase (Oh-see) Schoen (Shane)** has requested that any members who are willing to speak to students at the grade school, middle school, or high school levels on earth science-related topics to please contact her by e-mail at aase@silcon.com, or by phone at **(925) 284-7045**.

Northern California Geological Society
c/o Judy Hayes
453 Scotts Mill Rd.
Danville, CA. 94526-4234

Would you like to receive the NCGS newsletter by e-mail? If you are not already doing so, and would like to, please contact **Dan Day** at dday@nrmc.com to sign up for this service.

NCGS 2000-2001 Calendar

Joint Meeting with Bay Area Geophysical Society (BAGS)

Wednesday, November 29, Orinda Masonic Center, Orinda, CA.BAGS -NCGS FAMILY NIGHT

Chris McKay, NASA Ames Research Center, Mountain View, CA.

Landscape Geomorphology and the Search for Water on Mars: Implications for the Development of Life

Saturday, December 2, 2000

Chevron 3-D Visualization Demonstration at Chevron Park, San Ramon (see flyer in this newsletter)

Presented by *Bob Kieckhefer* and *Vernie Green* (COPI)

Friday, December 8, 2000, Chevron Park, San Ramon, Building A, Room A-1012, 11:30 am

Marlon Downey, AAPG President

Predicting the Future

Hosted by Chevron Overseas Petroleum, Inc. (see notice in this newsletter)

2001

Saturday, January 27, 2001, 9:00 am at site TBA (Please check future newsletters for details)

Caldecott Tunnel Field Trip

Leader TBA (Trip is being arranged by *Jean Moran*, Stetson Engineers)

A trip including a movie of the tunnel construction, a trek through tunnel air ducts, and local geology synopsis

Wednesday, January 31, 2001

TBA

Orinda Masonic Center

February 2001

John Warme, Colorado School of Mines, Golden, CO.

AAPG Distinguished Lecture

Anatomy of an Anomaly: The Catastrophic Devonian Alamo Impact Breccia, Nevada

Tentative Joint Meeting with BAGS. Location and date open

March 2001

Andrew Pulham, University of Colorado, Boulder, CO.

AAPG Distinguished Lecture

Reservoir Performance and Reservoir Quality in a Sequence Stratigraphic Framework: Case Studies from Siliciclastic Reservoirs in the Americas and Europe

Location and date open (COPI most likely)

Wednesday, April 25, 2001

Laurel Collins, San Francisco Estuarine Institute

Tentative topic: **Wildcat Canyon: Watershed and Sedimentation Interactions**

Orinda Masonic Center

Wednesday, May 30, 2001

Dave Mustart, San Francisco State University

Tentative title: **Hydrothermal Pipes in Six Granitic Plutons in California: Evidence for Evolution and Migration of a Magmatic Volatile Phase**

Orinda Masonic Center

Wednesday, June 27, 2001

Bruce Jaffe, USGS Menlo Park

Tentative Topic: **Mercury Contaminated Hydraulic Mining Debris in North San Francisco Bay: A Legacy of the Gold Rush**

Orinda Masonic Center

Wednesday, September 26, 2001

Richard Sedlock, San Jose State University

Tentative title: **Blueschists and Ophiolites in Baja: Coast Range Geology, But With Outcrops**

Orinda Masonic Center

Bay Area Geophysical Society Fall 2000 Calendar

Joel Walls of Rock Solid Images will talk about attributes. Exact title and time TBA, **Fall 2000**

Robert H. Tatham, University of Texas, Austin, will discuss Multicomponent Exploration Technology. Tentatively **February 2001** title and time TBA.

For more information, check the BAGS website at <http://sepwww.stanford.edu/bags/>

The Relationship of Sedimentary Basins and Associated Petroleum Systems To Global Tectonic Cycles Discussed At October NCGS Meeting

Retired Chevron Overseas Petroleum Senior Geologic Advisor and independent consultant **Frank J. Picha** presented an excellent synopsis of sedimentary basin development, petroleum reservoir genesis, and their relationship to global tectonic cycles as an important exploration tool at the October 25th NCGS meeting. His presentation *Sedimentary Basins and Petroleum Systems in Terms of Global Tectonic Cycles* outlined the concepts that tie sedimentary basin development and associated petroleum systems to recurring global tectonic cycles. It is the AAPG Distinguished Lecture that Frank recently gave to eastern European countries and Eastern Block nations. This presentation not only covered geological topics—it also presented a glimpse into the geological philosophies of the former Soviet Union courtesy of Frank's experience as a Chevron Overseas Petroleum representative to Soviet Central Asian Republics.

A central theme to this talk is the need to expand current global tectonics concepts to the Eastern European nations, while informing the petroleum geological community of the need to focus on these concepts to improve future exploration efforts. Now the former Soviet Union is endorsing the concepts of Plate Tectonics. But the change is slow and confronted with opposition from the old guard. Frank's core concept is that the world is annually discovering only 4 to 9 billion barrels of oil, which will require improved exploration techniques to meet our future fuel consumption needs. There is a definite need for scientists to focus on regional scale geology and geophysics, which are unfortunately, the same areas that major oil companies are now downsizing in their mergers and consolidation processes.

Oil exploration requires a good understanding of petroleum generation systems. Sedimentary basins are an important part of this conceptual framework. To date over 400 basins and sub-basins have been identified and classified around the world. Currently exploration geologists use plate tectonic systematics to categorize basins. The processes associated with these repetitive geological cycles include rifting, thermal sagging of rifted zones, opening of continental margins, basin sedimentation, basin closure, orogeny (mountain building), and fold and thrust belt formation. These concepts are part of a two-fold trend that initially involves a divergent paradigm of intracratonic rifting followed by oceanic opening and passive continental margin formation. The subsequent convergent part of the tectonic cycle involves closure via subduction, continental collision, and orogenesis. Key basin environments and their hydrocarbon potential evolve at various points in this global tectonic cycle based on their specific tectonic and depositional histories as determined by the succession of critical stages in the plate tectonic

cycle. These include initial rifting, crustal thinning and sagging, drifting, succeeded by convergence marked by subduction and continental collision. How these various facets of the cycle evolved is critical to hydrocarbon development. The most enticing petroleum provinces are associated with rift and intracratonic rift-sag basins, passive continental margins of rifted divergent settings, the foreland basins and fold-and-thrust belts of convergent settings, and borderland basins of transform margins (the San Andreas transform fault-coastal California basin system).

Frank has studied basins around the globe and displayed a map that he developed to illustrate and classify basins in Africa. The African continent is perhaps the best place to study basins and their evolution. It contains intracratonic and rift type basins, and hosts a major tectonic basin cycle that began in the Mesozoic. The oil-rich Saudi Arabian peninsula experienced a basin-forming tectonic cycle that began in the Paleozoic, creating a large marginal platform that collapsed during the closure of the Tethian Sea, and has subsequently remained a passive continental margin. Frank then described the basins in South America, with its Precambrian cratonic rocks, intracontinental basins, and marginal Atlantic basins bounded on its western seacoast by the Andean subduction complex.

Petroleum systems require the proper organic-rich source rocks, conditions which cause petroleum hydrocarbon generation and migration, the appropriate reservoir rocks along the migration pathway, and the necessary trapping and sealing mechanisms. The timing of these events is of the utmost importance. However, these stages have been known to overlap two major tectonic cycles. The best examples of intracratonic rift basins are in Africa where rifting occurred in the Paleozoic, Mesozoic, and Cenozoic Eras. The Doba Basin in Chad shows all the elements necessary for petroleum reservoir development in one rifting stage, while the Gulf of Suez experienced early Miocene rifting, post-rifting evaporite cap-rock deposition, followed by oil generation from pre-existing Paleogene organic-rich sediments and migration into half-graben reservoirs beneath the evaporites.

Intracratonic rift-sag basins involve crustal doming (thickening), rifting and sediment starved basin formation, followed by crustal sagging and an influx of sediment. An example of this type of basin is the North Sea Central Graben. It represents a Permian rifting event followed by a second episode of Jurassic rifting, thermal sagging and Paleogene-Neogene sedimentation, and high heat flow that caused petroleum genesis and oil migration into fractured chalk beds and channelized Paleogene turbidites. The West Siberian Basin, one of the largest gas provinces in the world, forms a vast lowland bounded on the west by the Ural Mountain range, to the north by the Arctic Ocean, on the east by the East Siberian Upland craton, and to the south by a Hercynian mountain belt in Kazakhstan. The underlying geology is very complex and is underlain by a triple junction rift zone that filled in with organic rich shales that acted as gas and petroleum source rocks. Unfortunately the overlying sedimentary sequence contains

few good reservoir rocks, although the most successful plays occur in clinofolds associated with fractured shelf sand sequences. The gas reservoirs are found in Cretaceous rocks northward near the mouth of the Ob River. The province has an estimated 300 billion cubic feet of gas, approximately twice the U.S. reserves.

Passive continental margin basins involve rifting, oceanic sedimentation, and cap rock deposition. They are typified by many small half-graben structures in a crude stair-step arrangement. The deep water Campos Basin off the eastern coast of Brazil is one such basin that began with rifting and anoxic clay sedimentation, deposition of an overlying capping evaporite sequence, passive margin formation, and ended with clastic sedimentary deposits and turbidites whose distal ends provided the best petroleum reservoir rocks. The lower Congo Basin in Angola formed in a rift environment that filled with organic shales capped with a carbonate sequence that is overlain by clastic sediments. The best plays in this field are in the synrift sediments and more recent proximal ends of channelized turbidite deposits.

Orogenic belts associated with thrust belts and foreland basins are also important gas and petroleum resources. They involve the deep water shaly flysch deposits and the shallow water molasse sediments. The Alps are perhaps the most famous thrust-foreland basin orogenic belt, overshadowing their neighboring Carpathian Mountains in the former Czechoslovakia and parts of Poland, the Ukraine, and Rumania. The Carpathians, with which Frank is quite familiar, are actually two overlapping thrust belts that juxtapose the southern Apulian Plate over the eastern European Plate. Both the upper and lower thrust complexes are collapsed passive margin platform-foreland basin sequences with the deep water flysch thrust over the platform molasse deposits. Wrench faults opened up basins on top of the thrust plate (Vienna Basin). The larger Pannonian Basin lies on top of the overriding thrust complex and was formed by middle Miocene rifting and thermal sagging in a back-arc basin environment. The Vienna Basin acts as a reservoir for petroleum generated in older sediments in the thin-skinned Carpathian thrust belt. Frank also feels that the thin overlying thrust sheet is trapping petroleum in the appropriate reservoir rocks of the underlying Hercynian thrust complex.

Frank concluded by noting that recent petroleum exploration efforts have yielded only 4 to 9 billion barrels of oil per year in new discoveries. The last major oil discovery was Prudhoe Bay in Alaska. The 1990's produced significant finds in the northern Caspian Sea, West Africa, and coastal Brazil. By combining the new technological advances in data acquisition and analysis with improved understanding of basin formation and its relationship to petroleum genesis, society would have a significant exploration tool for uncovering yet undiscovered hydrocarbon deposits in recognized tectonic settings.

The NCGS sincerely thanks Dr. Frank Picha for presenting this recent AAPG Distinguished Lecture to its members. His lecture gave an exciting synthesis of various

basin-forming processes as related to major global tectonic cycles which have been repeated throughout the earth's history. This information was supplemented by Frank's tremendous knowledge of global hydrocarbon deposits, and a very fascinating discussion he gave of geological philosophy in the resource-rich former Soviet Union.

Earth Science Teachers Get A Glimpse of Northern Sierra Geology at NAGT Far West Section Conference in Blairsden

Over 100 geoscience teachers from the Far West Section of the National Association of Geoscience Teachers (NAGT) were treated to eight excellent field trips in the Northern Sierras at the September 8 to 10th Conference in Blairsden, CA. This semi-annual meeting of K-12 and college teachers was expertly hosted by recently retired California State University Hayward professor **Elwood "Woody" Brooks** and his staff, headed by long-time CSUH Geology Department Instructional Support Technician **Phil Garbutt**.

The event was headquartered at the Feather River Inn in Blairsden, a local landmark heralding from the days of President Woodrow Wilson. Four field trips were featured on Saturday and three on Sunday. They included Neotectonics of the Sierra Nevada-Basin and Range Boundary with **John Wakabayashi** and **Thomas Sawyer**; The Revised Tertiary Stratigraphy of the Blairsden Quadrangle led by **David Wagner**, **George Saucedo**, and **Dr. Trobe Grose**; Late Paleozoic Island-Arc Deposits in the Lakes Basin, Southern Plumas County led by **Elwood Brooks**; Devonian Sierra Buttes Formation, Jamison Lake-Wades Lake Area, Southern Plumas County hosted by **Steven Silva**; Cretaceous Tonalite Stock and Related Dike Swarms < Lakes Basin, Southern Plumas County with **John Lull**; The Feather River Ultramafic Belt Along the North Fork of the Feather River led by **Jason Mayfield**; and Mafic Metavolcanic Rocks of the Beacon Point Formation, Verdi Range, Sierra County with **Bruce Pauly**.

Saturday evening, members attended a banquet at the Feather River Inn followed by a presentation by **Dr. Eldridge Moores** of U.C. Davis entitled *Ophiolites, the Sierra Nevada, and "Cordillera": Orogeny Along the Pacific and Caribbean Margins of North and South America*. The talk proposed that much of the tectonic development of the Pacific and Caribbean margins of North and South America resulted from interaction of these continents with a Philippine-like plate dubbed "Cordillera" that existed west of the Americas during Mesozoic-early Cretaceous time.

The conference was affordable and offered several food and lodging options. Participants received a superb color guidebook of all seven field trips, and the opportunity to purchase literature from California Division of Mines & Geology representatives. In the Fall 2001, this conference will be hosted by the San Jose State University and the U.S. Geological Survey, Menlo Park.

NCGS Spring 2001 Field Trip

The Golden B.E.A.R. (Blueschists, Eclogites, Amphibolites, Refreshments) Tour 2001

Led by Dr. John Wahkabayashi, Consultant, Hayward, CA.

Tentatively planned for May, 2001

This two day trip will feature the most beautiful metamorphic rocks in California, the blueschists, eclogites, and amphibolites of the Franciscan Complex. These rocks have a fascinating history and have helped make the Franciscan one of the world's best known rock units. The rocks viewed on this trip are so gorgeous that they can be appreciated by the geologist and non geologist alike. For those that believe that no Franciscan geology puzzle is complete without a pint to help solve it, we offer stops at some of the world's most acclaimed small breweries. These brewpubs are chosen for their fine (and reasonably-priced) food as well as their award-winning brews, so these establishments can be appreciated by those who wish to pass on the brew as well. This trip will use a bus or buses, so that no one will have to drive. The planned date is early May, when wildflowers at some of the stops are at their peak.

The following is a (very) tentative itinerary.

SATURDAY

Stop 1: Ring Mountain, Tiburon Peninsula. This stop visits the dazzling crown jewel of Bay Area geology to view beautiful blueschists, eclogites and amphibolites. The metamorphism of these rocks gives us clues to processes that occur at the initiation of subduction. The rocks are so captivating it is not an exaggeration to say that it would be possible to spend the entire day here. But, we have other nice places to go...

Stop 2: Marin Brewing Company, Larkspur. Marin's Mt. Tam Pale Ale and IPA are benchmark beers, award-winning beers, and the pub food selection here is among the best of Bay Area brewpubs.

Stop 3: (may be swapped with Stop 4, depending on time). Skaggs Springs schist near Lake Sonoma. This is a classic blueschist unit that makes up a belt that crops out over a distance of 70 km. The visit to this schist includes viewing some fascinating field relations that include the occurrence of amphibolite, eclogite, and garnet amphibolite blocks in shear zones that cut the Skaggs Springs schist.

Stop 4: Bear Republic Brewing Company, Healdsburg. This brewery has won a Great American Beer Festival gold medal with its Racer 5 IPA, and some hop-lovers (including me) think their Extra Pale Ale is even hoppier (especially if it's the cask conditioned version). The food is noteworthy, especially the incomparable herb-garlic fries, that feature melted parmesan over fries with tons of garlic, rosemary and parsley--all this and they're not greasy or overly salty, either. Best garlic fries on the planet, bar none!

Stop 5: Anderson Valley. This is a basin that may offer some clues as to neotectonic mechanisms operating in the northernmost San Andreas fault system. This basin may be formed as a pull apart along a as-yet-unidentified fault that is transferring slip westward from the Maacama fault.

Stop 6: Anderson Valley Brewing Company, Boonville. One of the West Coast's most acclaimed small breweries. Everyone seems to have their favorite Anderson Valley brew, whether it is their awesome Hop Otton IPA, the Boont Amber, the Belks ESB, or their great barleywine, Horn of the Beer, among many others. This is a pre-dinner drink stop or dinner depending on plans. We will probably camp somewhere in the vicinity.

SUNDAY

Stop 1: Jenner. This is a well known eclogite locality at the mouth of the Russian River. Most field trips visit a well-beaten block above Highway 1. Much more interesting is the pile of blocks on the north bank of the river at its mouth. In terms of beautiful blueschist, eclogite, and amphibolite blocks per unit area, this place takes the cake. No words can describe just how dazzling this pile of glittering blocks is.

Stop 2: Nicasio Reservoir: Pillow basalts and gabbro. Yes, these are not blueschists, but the rocks are very interesting. The pillow basalts are some of the best in the Coast Ranges, and are probably part of a seamount that was incorporated into the Franciscan.

Stop 3: Moylan's, Novato. Moylan's produces some fine ales, particularly some of their specialty beers, such as their Imperial Stout and barleywine.

Stop 4: Moeser Lane, El Cerrito. This stop is a few hundred meters south of one of my favorite geology stops (the Schmidt Ave. quarry). This stop features one of the East Bay's amphibolite and blueschist stops. Alternatively, depending on interest, the Schmidt Avenue stop, with its superb structural relationships (exposed fault of blueschist facies greywacke over lower grade rocks) can be substituted (somewhat easier on a bus' clutch and brakes, too).

Employment Opportunities

Hydrogeologist, San Francisco State University

The Department of Geosciences invites applications for a tenure-track faculty position at the assistant professor level in hydrogeology, beginning August 2001. The position requires a Ph.D. in geology or a related field and a strong commitment to excellence in teaching undergraduate and graduate courses in hydrogeology and groundwater contamination, with secondary involvement in engineering geology and/or geophysics. Responsibilities will include maintaining an active research program that involves graduate and undergraduate students. We seek someone who will work with local environment firms and agencies and assist in building our new graduate program in Applied Geosciences. Some teaching and industry experience is preferred; strong quantitative skills are essential.

The Department of Geosciences includes geology, meteorology, and oceanography and consists of 13 faculty members from these fields. The department offers BS and BA degrees in Geology, a BA degree in Meteorology and a MS degree in Applied Geosciences.

San Francisco State University, a member of the California State University system, serves a multi-cultural, ethnically diverse student body of 27,000 students, offering bachelor's degrees in 117 academic areas and master's degrees in 95 fields of study. Excellence in teaching is the University's primary mission, although SFSU faculty are expected to demonstrate professional achievement and growth through continued research, publications and community involvement.

To apply, send a curriculum vitae, a statement of teaching and research interests, and names and addresses of three references to:

Karen Grove, Department of Geosciences, San Francisco State University, 1600 Holloway Ave., San Francisco, CA 94132.

Applications should be received before January 15, 2001.

San Francisco State University is an Equal Opportunity/Affirmative Action employer.

SLAC Employment Opportunity

Title: Environmental Engineer

Posted: 10/02/00

Duties: As a member of SLAC's (Stanford Linear Accelerator Center) Environmental Protection and Restoration Department, the Candidate will help perform & oversee all aspects of SLAC's Excavation Clearance Program. The Candidate will be responsible for evaluating the potential for chemical contamination at sites to be excavated for new construction or maintenance work. Duties will include reviewing historical information, developing sampling plans to evaluate potentially contaminated sites, conducting sampling, coordinating sampling with outside contractors and consultants for larger projects, overseeing field work, coordinating chemical analyses with outside laboratory, performing data validation using established procedures, and completing sampling reports. Candidate will be expected to maintain a working knowledge of various regulatory requirements and how they may impact projects. Candidate shall also assist with all aspects of RI/FS studies, remediation activities, and environmental compliance. Duties shall include planning field studies, developing work scopes, performing field work, and conducting field oversight of consultants and subcontractor work, interpreting data, conducting water quality monitoring, writing and illustrating work, and giving presentations to stakeholders on work status. Requires follow-through to ensure deliverables are met on time and within budget. Field work is required which will include some early days, late evening and occasional weekend work; besides these times the work environment will be flexible and allow for time off and work at home.

Skills: Formal Education to the BS or MS level in Civil or Environmental Engineering or in a scientific field related to the above duties; 1 to 3 years experience and 40-hour OSHA Hazardous Waste Operations Training Certification is desirable. Demonstrated high scholastic achievement is preferred. Must have excellent communication and writing skills.

Send Résumé to:

Stanford Linear Accelerator Center, Environmental Protection and Restoration Department,
2575 Sand Hill Road, MS-77, Menlo Park, CA 94025
attn: Trish Garriz / FAX: 650-926-3175

For more information see: <http://www.slac.stanford.edu/jobs/jobs.htm> keyword: Engineering, job number 20239

Montgomery Watson Job Openings

Montgomery Watson, a worldwide leader in environmental consulting and remediation for hazardous waste, has the following positions available in their Industrial & Federal Operations Program in Walnut Creek, CA:

Project Managers and Project-level Hydrogeologists/Geologist Responsibilities include project management, project execution, scope development, cost estimates, data interpretation, remedial system design, construction oversight, technical writing, logging, well installation, collection of soil/groundwater samples, remedial investigations, feasibility studies, and OM&M for hazardous waste projects. OSHA 40-hr training preferred. Positions require BS/MS degree, 0-8 years experience in civil, environmental, mechanical, or chemical engineering or geology/hydrogeology. Some travel and field work required. HTML & other programming and/or RCRA/CERCLA knowledge a plus.

Database Manager. Responsibilities include design and maintenance of environmental databases and integration of reporting systems. A minimum of two years working in the environmental industry is required. Must have a working knowledge of database systems and proficiency working with MS Access, SQL Server, or Oracle platforms. Experience with VBA, SQL, C++, J++ and/or internet development experience is a plus. Opportunities to expand application development/internet development skills.

If interested, submit resume to **Montgomery Watson, 1340 Treat Blvd., #300, Walnut Creek, CA 94596** or fax (925) 975-3412 or e-mail to denice.burchett@mw.com. MW values workplace diversity.

CALL FOR PAPERS

Pacific Section American Association of Petroleum Geologists and Cordilleran Section of the Geological Society of America JOINT MEETING

April 9-11, 2001

SHERATON UNIVERSAL HOTEL, UNIVERSAL CITY, CALIFORNIA

Abstract Deadline: December 20, 2000

For more information on the technical program and to submit an abstract online, go to the GSA website at <http://www.geosociety.org/sectdiv/cord/01cdmtg.htm#abs>

If you have questions, contact Co-chairs **Peter W. Weigand** at (818) 677-2564, or **Jeffery E. Shellebarger** at (661) 395-6385

NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



AAPG Special Guest Lecture

"Predicting The Future"

Presented by Marlan W. Downey, AAPG President
Hosted by Chevron Overseas Petroleum Inc. and NCGS

Friday, December 8, 2000

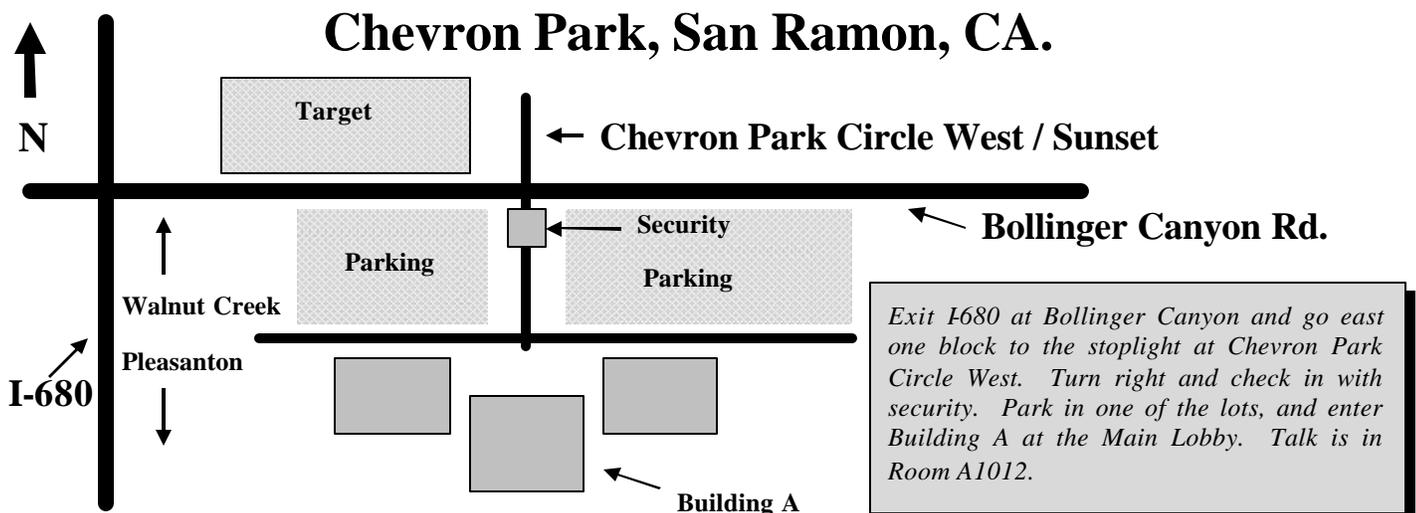
11:30 a.m. in Room A1012, Building A, Chevron Park
6001 Bollinger Canyon Road, San Ramon, CA.

The oil and gas business requires a lengthy time from choice of investment until successful return on investments. Long term investments require consideration of future outcomes. Such analysis represents a prediction of the future; future prices, future costs, future production volumes, future taxes or political risk. Selecting the best investments for growth and future profits requires that the investor understand the uncertainties of predicting the future.

Many have tried to predict the future. Few have had any success. No one consistently has shown accuracy in predicting the future. If it is important to predict the future, why do we do it so poorly? Are we listening to the wrong people? Do we have the wrong astrologer? Is our science of forecasting at fault?

We will discuss some general axioms on predicting the future; when is it possible, when not. In managing business for the long term, we must understand that the future will never be exactly as we planned or hoped. By maintaining options and flexibility, we can buffer ourselves from the consequences of an always uncertain future.

Marlan W. Downey is the former President of Pecten International; former President of Arco International, and the former Bartell Professor of the University of Oklahoma. He was recently honored by the Houston Geological Society as "A Living Legend in the Oil Business". Marlan has written thirty-six invited articles for the Explorer magazine, and is the current AAPG President.



If you need more detailed directions to Chevron Park, San Ramon, please call Dan Day at 925-294-7530.

Geology and 3-D Demonstration of Absheron Prospect, Caspian Sea

Hosted by Chevron Overseas Petroleum Inc.

3-D Visualization Center, San Ramon, CA.

9:30 a.m. Saturday, December 2, 2000

No cost; please register before Thursday, November 30th (see below)

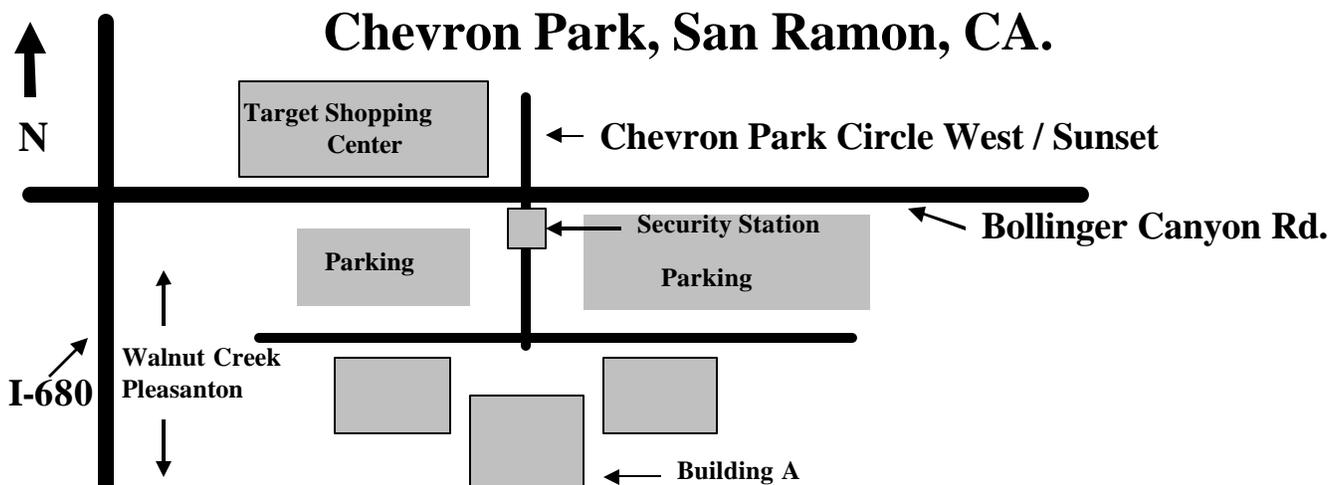
Chevron Overseas Petroleum Inc. (COPI) relies on state-of-the-art computer technology in its exploration and production of oil and natural gas outside of North America. One of the company's 3-D Visualization Centers is in COPI's headquarters in San Ramon. Powered by an SGI Onyx computer, this center has a 25-foot-wide screen on which groups of earth scientists can view seismic and well data, reservoir simulations, and other large data sets. One large COPI project from the Caspian Sea region will be presented to NCGS attendees in the Visualization Center.

Bob Kieckhefer and **Vernie Green** will show 3-D seismic data and will review the Absheron prospect, in the deep-water Caspian Sea offshore Azerbaijan. This prospect is a large 4-way dip-closed anticline in Plio-Pleistocene clastic sediments, located between a 4-billion-barrel oil field and a recent major gas discovery. Though simple, the anticline is broken by several sets of minor extensional faults whose en-echelon pattern suggests that a minor component of left-lateral shear is deforming the compressional fold. These minor faults are easily mapped in the 3D seismic data using Chevron's proprietary software. Submarine channels are also imaged well on the 3D data. Recent site-hazard work has delineated highly reflective recent flows from the prospect's quite active mud volcano. Chevron and its partners **TotalFinaElf** and **SOCAR** plan to drill the first well early in 2001.

PLEASE TAKE NOTE!!! The originally scheduled discussion and presentation of seismic data from the Tengiz oil field in Kazakhstan by Dr. Frank Picha has been cancelled. One of Chevron's partners in this joint venture, **Exxon-Mobile**, has objected to formal discussions and demonstrations of the Tengiz data, so we regret that this will be omitted from the presentation. However, all of the 3-D and other visual features that were intended to be demonstrated to the viewers are included in the Absheron Prospect data. The omission of the Tengiz oil field performance will, therefore, NOT detract from the real reason you want to see this demonstration---to see a state-of-the-art computer imaging system dedicated to processing enormous amounts of seismic data to compile a three-dimensional image of subsurface geology!!!!

Attendance will be limited! In order to provide access to this center on a weekend, **Chevron security requires you to register for this event no later than Thursday evening, November 30th. Register before November 30th by leaving your name and a phone number where you can be reached on the NCGS voice recorder at 925-294-7530.** Food and drink are strictly prohibited in the Visualization Center, and smoking is not allowed in any Chevron building.

Directions: Exit I-680 at Bollinger Canyon and go east one block to the stoplight at Chevron Park Circle West. Turn right into Chevron Park and park in the right-hand parking lot. Proceed to Building A through the Main Lobby entrance. The security guard at the reception desk will give attendees clearance badges. **Bob Kieckhefer** will escort the group to the Visualization Center for the 3-D demonstration. **For more detailed directions to Chevron Park, San Ramon, call Dan Day at 925-294-7530** or e-mail him at dday@nrmc.com.



NORTHERN CALIFORNIA GEOLOGICAL SOCIETY



Bay Area Geophysical Society-NCGS Family Night

6:30 p.m. Wednesday, November 29, 2000

At the Orinda Masonic Center

9 Altarinda Road, Orinda, CA.

BAGS-NCGS Joint Meeting: Friends and Family Invited

Guest Lecturer: Chris McKay, NASA Ames Research Center, Moffett Field

Landscape Geomorphology and the Search for Water on Mars: Implications for the Development of Life

Mars appears to be cold dry and dead world. However there is good evidence that early in its history it had liquid water, more active volcanism, and a thicker atmosphere. Mars had this earth-like environment over three and a half billion years ago, during the same time that life appeared on Earth. The main question in the exploration of Mars then is the search for an independent origin of life on that planet. Ecosystems in cold, dry locations on Earth --- such as the Antarctic --- provide examples of how life on Mars might have survived and where to look for fossils.

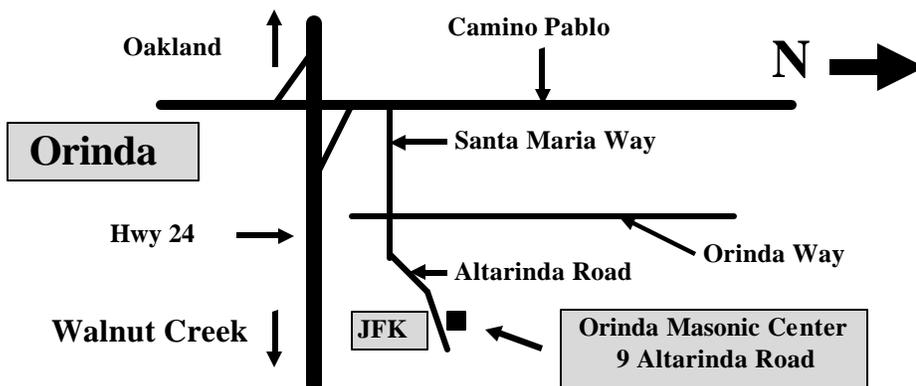
Dr. Christopher P. McKay, Space Science Division, NASA Ames Research Center

Chris received his Ph.D. in AstroGeophysics from the University of Colorado in 1982 and has been a research scientist with the NASA Ames Research Center since that time. His current research focuses on the evolution of the solar system and the origin of life. He is also actively involved in planning for future Mars missions including human settlements. Chris has been involved with polar research since 1980, traveling to the Antarctic dry valleys and more recently to the Siberian and Canadian Arctic to conduct research in these Mars-like environments.

TIME: 6:30 p.m. Social; 7:00 p.m. talk; NCGS will provide refreshments and beverages

COST: \$5.00 per person; \$5.00 for families

RESERVATIONS: Leave your name and phone number at 925-294-7530 anytime before the meeting.



For more detailed directions to the Orinda Masonic Center, contact Dan Day at 925-294-7530 or by e-mail at dday@nrmc.com

