



Colorado Scientific Society

*The objective of the Society is to promote
The knowledge and understanding of Earth science,
And its application to human needs*

S.F. Emmons Lecture



Science Results from the Mars Exploration Rover Mission

Dr. Steven W. Squyres, Cornell University

Tuesday, January 8, 2008

**Colorado School of Mines, Green Center, Metals Hall
924 16th St (between Illinois and Arapahoe), Golden
Social half-hour – 7:30 p.m. Meeting time – 8:00 p.m.**

Abstract

Science Results from the Mars Exploration Rover Mission

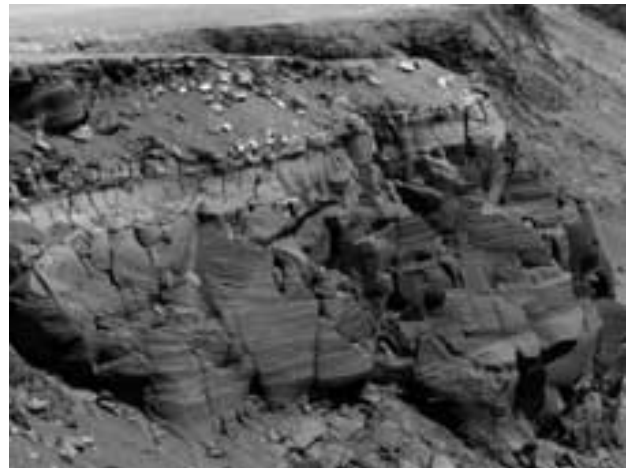
By Steven W. Squyres, Goldwin Smith Professor of Astronomy, Cornell University; Principal Investigator, Mars Exploration Rover Project

The two Mars exploration rovers, Spirit and Opportunity, touched down on Mars in January 2004 and have been conducting extensive observations with the Athena science payload. Together the two rovers have traversed approximately 16 km. Spirit, located on the floor of Gusev crater, has investigated basaltic plains, as well as older materials in the Columbia Hills. The rocks of the Columbia Hills are largely clastic in nature and range from breccias to finely laminated deposits that have undergone significant aqueous alteration. They appear to be largely a mixture of altered impact ejecta and explosive volcanic materials. Recently, Spirit has discovered silica-rich deposits that may have formed in a hot spring or

fumarole environment. Opportunity has carried out the first outcrop-scale investigation of ancient sedimentary rocks on Mars. The rocks are sandstones formed by wind and water erosion and re-deposition of fine grained siliciclastics and sulfate-rich evaporites. The stratigraphic section observed to date is dominated by eolian bedforms, with subaqueous current ripples exposed locally near the top of the section. While liquid water was present at Meridiani below and occasionally at the surface, the ancient environmental conditions recorded there are dominantly arid, acidic and oxidizing, and would have posed some significant challenges to life.



Cross bedding at Cape St. Mary, Victoria Crater



Cliff exposure, Cape St. Vincent, Victoria Crater

Photos by Opportunity, which spent about 300 Martian days traversing the rim of Victoria Crater, 2006-2007.

President's Notes, January 2008

By Matt Morgan

I am grateful for the opportunity to receive the silver gavel from Bill Nesse and be your president for 2008. After looking over the long list of past presidents, I know these are big shoes to fill and I will do my best to provide sound, solid leadership. Other changes are taking place as well; as we bring in the New Year, the CSS will be welcoming in new council and committee members. The opinions and viewpoints of these individuals are a key in helping the CSS move forward and meet new challenges. If you feel strongly about the direction of the CSS, I encourage you to get involved as a committee member. We can always use more help!

The council will be tackling several key topics this year that will have an impact on how the CSS will function in the future, namely, our investment strategy for the memorial funds. As Bill Nesse discussed in last month's President's Notes, there is roughly \$250,000 in the funds that is currently invested in bonds and certificates of deposit through a brokerage firm. The CSS committee is looking at other investment options that may give us a (slightly) better return on our money. Some of you have already suggested that the best option is to stick with the current make-up. I assure you we

will be weighing all of our options and welcome any and all comments from the CSS members regarding our investments.

We are also assessing the possibility of turning Family "Night" into Family "Day." Instead of the lecture and dinner we could run a kids field trip, do some mineral or fossil collecting, host a workshop, or other family-oriented activities that would allow you and your family to enjoy Colorado and the outdoors. Plus it would be a great way to meet fellow CSS families.

As each of the President's remarks from the last several years has stressed, WE NEED NEW MEMBERS! To keep the CSS the preeminent scientific organization in Colorado and to keep it vital we count on each and every one of you to spread the word and recruit. Tell your friends, your co-workers, and your families about the fantastic talks, field trips, and activities that the CSS brings you throughout the year. Give a membership or a fund donation as a gift! It is the members that keep us going and I appreciate all your contributions. I am looking forward to another great year working with all of you.

CSS Archival Preservation Group, Hard at it

By Beth Simmons

On November 25, Tom Steven, Dan Shawe, Marj MacLachlan, and I sat down to the pile of minutes in the archives of our Colorado Scientific Society and sorted, classified and stashed all the records of the meetings from 1933 - 1984! Dan asked, "When do minutes turn to hours.....?"

From times long past, the first secretary's book is missing (1882-1892), along with what should be numbers three and four, and perhaps five, covering the time gap from 1904 to 1933. There don't seem to be any minutes in the files for 1985-1989, and from 1990 to the present day. If anyone has the minutes (or recording book) for those years, either of the regular meetings, council meetings, or both, please make copies and turn them over to me. THANKS!

Also, we are missing a newsletter from May of 2002. If anyone has an ecopy or hardcopy of it, could

you submit it for the files? The other missing newsletter is October, 1976, but from reading the September newsletter, I think it was dispensed with because of Denver hosting GSA that month. There was no October meeting that year.

Next session..... MEMBERSHIP files! Every dues card and every application for membership for the last 100 years has been saved, we think!! And we know who DIDN'T pay their dues!!!

And we had a great idea for our 125th celebration! Let's have a reunion! We can locate all our delinquent living members, past presidents and officers, rile them up and get them to come to a great big party! (And have a fun speaker - nothing really heavy, scientifically) The venue could be Red Rocks, where Dinosaur Ridge hosts their annual banquet. Just a thought!



DUES & FUNDS CONTRIBUTIONS COLORADO SCIENTIFIC SOCIETY

(Last Name) (First Name) (Initial)

(current email, if available)

DUES: Dues are for the calendar year (January-December)

Regular Members (\$20, CO Front Range)	_____
Corresponding Members (\$10)	_____
Student Members (\$5, enrolled in college)	_____

MEMORIAL FUNDS: These funds support earth-science research grants to graduate students throughout the nation. If your contribution is not specified, it will be distributed equally among the funds:

(A) Ogden Tweto Memorial Fund	_____
(B) Steven Oriel Memorial Fund	_____
(C) Edwin Eckel Memorial Fund	_____
(D) Bill Pierce-Heart Mountain Fund	_____
(E) George Snyder Memorial Fund	_____
(F) Chuck Pillmore Memorial Fund	_____
This contribution is made in the memory of:	_____

ENDOWMENT FUND: This fund is used to support the Society's monthly

meetings and newsletter, field trips,
family night, annual Emmons Lecture, and special
activities.

TOTAL CONTRIBUTIONS (DUES AND FUNDS):

Please make your checks payable to the Colorado Scientific Society

**Send this form
& your check to:**

**Colorado Scientific Society
P.O. Box 150495
Lakewood, CO 80215-0495**



Earth Science Meetings and Talks

Newsletter items must be received by the 25th of each month. Items may include special events, open houses, etc...thanks!



Colorado Scientific Society's regular meetings are held the 3rd Thursday of the month at the American Mountaineering Center in Golden (unless otherwise advertised). Social time begins at 6:30 p.m. and talks start at 7:00 p.m. For more information, contact Matt Morgan, at 303-866-2066, matt.morgan@state.co.us

Denver Mining Club meets every Monday (except when noted) at Country Buffet near Bowles and Wadsworth (at 8100 W. Crestline Ave.) 11:30-1:00. <http://china-resources.net>.

Denver International Petroleum Society meets the second Friday of each month at the Wynkoop Brewing Co., 18th and Wynkoop Streets. Reception begins at 11:30, luncheon at noon, program at 12:30. Make reservations (required) by leaving message at (303) 623-5396. Reservations accepted after 8 a.m. on Friday until 10:30 a.m. on Wednesday prior to the meeting. Cancellations accepted until 11:00 am Wednesday prior to the meeting. Cost: \$15 for lunches; talk only is available for \$2 (make checks payable to "D.I.P.S."). Contact Keith Murray at (303) 986-8554 for information.

Denver Region Exploration Geologists' Society (DREGS) meets in the Mutual Consolidated Water Building, 12700 West 27th Avenue, Lakewood. Social hour 6:00-7:00 p.m. Technical presentation at 7:00 p.m. Meetings are normally scheduled for the first Monday of each month. Jan 7, Buck Morrow, "Northland Resources' iron-oxide-copper-gold projects, northern Fennoscandia". For information contact Jim Piper, (303) 932-0137, or the website <http://www.dregs.org>.

Denver Well Logging Society (DWLS) meets on the third Tuesday of each month, Sept. through May. Lunch and a technical talk at the Wynkoop Brewery begins at 11:30 a.m., 18th and Wynkoop Sts. in Denver. Subject matter usually deals with the application of well logs to oil and gas exploration. Call Eleice Wickham at 303-573-2781 for reservations. Web page: <http://dwls.spwla.org>.

Rocky Mountain Association of Geologists (RMAG) Reception at 11:30, lunch at noon, talk at 12:30. Reservations by recording at 303-623-5396 until 10:30 a.m., Wed. before the luncheon. Cancellations until 11:00 a.m. on Wed. at 303-573-8621. Luncheon is \$20 payable to RMAG at the door. Talk only (no res)—cost is \$3. Location: Denver Marriott, 17th & California. Jan 4, Debra Higley-Feldman, "Petroleum source rocks for the northern Alberta oil sands, based on 4-D petroleum systems models". Jan 18, Jeff May, "Outcrop to subsurface correlation of the Blackhawk Formation, Uinta Basin." Web page: <http://www.rmag.org>.

Rocky Mountain SEPM Reception at 11:30, lunch at noon, speaker at 12:30. Reservations, Dave Uhl: 303-389-5092 before noon of preceding Friday. \$15.00 lunch, \$3 talk only. Wynkoop Brewing Company, 1634 18th St., Denver. David.uhl@EnCana.com.

University of Colorado at Boulder, Geological Sciences Colloquium Wednesdays, 4:00-5:30, Rm. 180. Refreshments at 3:30 on the 3rd floor. 303-492-8141. Web page: <http://www.colorado.edu/GeolSci>.

Colorado State University, Dept of Geosciences, Rm 320 Warner College of Natural Resources Bldg, Fridays, 4:10 pm. 970-491-5661. <http://www.cnr.colostate.edu/geo/seminars>

Friends of Dinosaur Ridge. Web page: <http://www.dinoridge.org>. Admission is free, but donations are welcome. Jan 30, Todd Green and Brent Breithaupt, Univ. of Wyoming, "Tracking the growth and tracks of emus." 7:00p.m., Visitor's center, 16831 W. Alameda Parkway. For more information contact the FODR Visitor Center at (303) 697-3466 or cloverknoll@comcast.net.

Colorado School of Mines, Van Tuyl Lectures Thursdays from 4-5 p.m. in Berthoud Hall room 108. <http://www.mines.edu/academic/geology.html>

USGS Geologic Division Colloquium. Thursdays, 1:30, Foord Room, Building 20, Denver Federal Center. For more information contact: Peter J. Modreski, U.S. Geological Survey, Denver, Colorado tel. 303-202-4766, fax 303-202-4767 email pmodreski@usgs.gov.

Café Scientifique, Wynkoop Brewery, 6:30-8:00, Jan 22, Connie Price, Denver Health, "From miasmas to MRSA's". Free, except for beer. <http://www.cafescolorado.org>

University of Northern Colorado Short Course, ESCI 575, Mar 8-9, "Earth materials in human and animal health", instructor Ulli Limpitlaw, 1 hr graduate credit, \$219. ulli.limpitlaw@unco.edu

For a constantly updated, online geo-calendar, visit the Colorado Geological Survey at <http://geosurvey.state.co.us>

Colorado Scientific Society
P.O. Box 150495
Lakewood, CO 80215-0495

<http://www.coloscisoc.org>



OFFICERS

President: Matt Morgan, CGS, 303-866-2066 matt.morgan@state.co.us
President-Elect: Don Sweetkind, USGS, 303-236-1828, dsweetkind@usgs.gov
Treasurer: Jeremy McCreary 303-744-0907 jeremy@cliffshade.com
Secretary: Lisa Fisher, CSM, 303-478-9427 (c), lfisher@mines.edu,
Past President: Bill Nesse, UNC, 970-330-7183, nesse@ctos.com

COUNCILORS

2007-2010: Jeremy McCreary 303-744-0907 jeremy@cliffshade.com
2007-2010: Tim McIntyre
2006-2009: Scott Minor, USGS, 303-236-0303, sminor@usgs.gov
2004-2007: Sue Hirschfeld, Cons., 720-565-9302, eqdoc@ix.netcom.com
2004-2007: Lee Shropshire, UNC, 970-352-8778, leeshrop@att.net

COMMITTEE CHAIRPERSONS

Best Paper Award: Matt Morgan, 303-866-2066, matt.morgan@state.co.us
Database Manager, membership changes: Cory Conrad, 303-629-8788, cconrad@knightpiesold.com
Field Trips: Karl Kellogg, kkellogg@usgs.gov
Graphics: Karen Morgan, CGS, 303-866-3529, karen.morgan@state.co.us
History: Beth Simmons, cloverknoll@comcast.net
Membership:
Memorial Funds: Bill Nesse, 970-330-7183, nesse@ctos.com
Newsletter Editor: Celia Greenman, CDOW, 303- 291-7327, celia.greenman@state.co.us
Outreach: Sue Hirschfeld, 720-565-9302, eqdoc@ix.netcom.com
Program: Emmett Evanoff, 303-444-2644, emmettevanoff@earthlink.net, Libby Prueher, Christine Turner
Publicity: Lisa Rukstales, lrukstales@usgs.gov
Science Fair: Chuck Weisenberg, 303-238-8806, cweisnbg@aol.com
Webmaster: John M. Ghist, 303-875-9671 jmghistcss@msn.com

**** STOP!** Don't recycle this until after the talk! Please help us with publicity by posting at least the front page of this Newsletter on a bulletin board. *Thank you!*