



# Colorado Scientific Society

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

## *March Presentations:*

### **“New Developments in the Carbon Cycle and Climate Change”**

**Jim White**

**University of Colorado Arctic and Alpine Research**

*And*

### **“Rocky Mountain Foreland Structures”**

**Don Stone**

**Consultant**

**Thursday, March 16, 2000**

**American Mountaineering Center**

**710 10<sup>th</sup> Street (NE corner with Washington)  
Golden, Colorado**

**Social Half-hour: 7:00 p.m.**

**Meeting Time: 7:30 p.m.**



## Mark's Message

Both snowy weather and a prolonged rush hour conspired against last month's regular Society meeting. Nonetheless, those hardy souls who braved the storm were treated to a fine description by Jonathan Caine of his research into faulting and its influence on fluid flow. Unfortunately, our second scheduled speaker, John Riess, could not be present. John has graciously agreed to present a special makeup talk on "Jupiter's Satellite Io, The Volcanic Moon" on March 22 on the Colorado School of Mines campus (look for details elsewhere in the newsletter).

It is my pleasure at this time to acknowledge a few of the many people who help keep Society activities running smoothly. If you enjoy receiving your paper copy of the newsletter, thank David Moore, who has unselfishly donated his time to reproduce the newsletter for more than a year now, on top of his publicity duties. If you could volunteer a couple of hours to help with the reproduction please contact Dave (236-1271, [dmoore@usgs.gov](mailto:dmoore@usgs.gov)). Special thanks also go to Lee-Ann Bradley who has provided skilled graphics for a variety of Society tasks (momento mugs, science fair certificates, etc.), often on short notice. Finally, Bill Wingle has ably taken up the reins as webmaster for the Society. The Society website ([www.rmi.net/~css](http://www.rmi.net/~css)) continues to provide up-to-date information for members and the outside community, as well as an archive of past speaker abstracts, etc. Lose your monthly newsletter? Check the website.

Keep watch for future announcements of the upcoming spring field trip that Sherman Marsh is organizing. We tentatively will be touring the geology of the Boulder area during June.

**-Mark R. Hudson, CSS President**



# New Developments in the Carbon Cycle and Climate Change

## Abstract of presentation by Jim White:

Humans continue to put ever-increasing amounts of carbon dioxide in the atmosphere every year via fossil fuel burning, deforestation and cement production. While it is reasonably clear that about half of that CO<sub>2</sub> accumulates in the atmosphere, it is still a subject of debate how much of the other half goes into the ocean versus land plants. Atmospheric observations of CO<sub>2</sub> concentrations and isotopic content indicate that land plants are a substantial sink for CO<sub>2</sub>, but a highly volatile one. Large sinks of CO<sub>2</sub> have been documented in the early 1990's, and a recent controversial study suggests that land plants in the United States may be capable of removing enough CO<sub>2</sub> to offset all fossil fuel emissions in the United States for a short period of time. But do we have the observational network we need to make such conclusions? Will we ever have such a network? Looking farther into the past, studies of CO<sub>2</sub> variability from ice cores tell us that the relationship between CO<sub>2</sub> and climate is stronger than previously thought, with a remarkably strong relationship apparent over the past 400,000 years. However, CO<sub>2</sub> levels never reached steady state in the Holocene, rising slowly over the past few millennia. With a growing number of studies pointing to major climate change as an abrupt, rather than slow process, the gaps in our knowledge of how carbon cycles in the environment need to be plugged and fast.

## Rain Ticket Talk by John Reiss

John Reiss has agreed to reschedule his talk: “Io- Jupiter’s Volcanic Moon” at the Colorado School of Mines, Room 108, Berthoud Hall, for the 22<sup>nd</sup> of March at 7:00 PM. (Talk begins at 7:30.) Let’s hope that the weather permits every one to hear John, and see the latest photo coverage of this strange and marvelous place.



# Rocky Mountain Foreland Structures

## Presentation by Don Stone:

Compressive, basement-involved, fault-related structures are the primary structural style within the Rocky Mountain foreland province. The causal fault zones can be divided into 1) basin-boundary megathrusts that border regional arches or platforms, and 2) smaller, basement-involved thrust zones within the basins and on the platforms. Displacement along these thrust zones produced the celebrated anticlinal "oil-field" structures of the Rocky Mountain basins. Seismic profiles, structural cross sections, and contour maps will illustrate some natural examples. Also, if time permits, structures produced by wrench duplexing, secondary detachment thrusting, and non-tectonic mechanisms (laccolithic intrusion, meteor impact) will be included.

## Just a Reminder

**Please remember to mail your membership dues.** Membership dues help support monthly meetings, field trips, family night, student night, the annual Emmons lecture and the production of this newsletter. There are 358 paying members (about 40 honorary), 151 have not paid their dues-Have you? If your newsletter mailing label says 2000 in the upper right corner, you are our good graces. If it says 1999, you are in arrears. Dues are a modest \$5-15 depending on status (student, corresponding, or regular). Prompt payment of outstanding dues would be greatly appreciated.

## Museums

**Friends of Dinosaur Ridge** For information call 697-DINO. Visitors' Center is located at 16831 West Alameda Parkway (north side of Alameda, just west of the C-470 overpass). Open 9 a.m. to 4 p.m. weekdays and weekends. Fireside chats are held at the Red Rocks Elementary School Cafe, in Morrison starting at 7 p.m.



## Spring-Summer Field Trip

This year's Spring-Summer field trip will be a one-day trip to Boulder to look at the geology of the Boulder area, and tour the new geology building. The field trip will probably be on either Saturday, June 10<sup>th</sup>, or possibly the 17<sup>th</sup>. We will travel by vans from the Cold Spring Park-n-Ride and return in the evening. We will, of course, have our usual sumptuous lunch in El Dorado Canyon, and watch the rock climbers. If one or more vanloads would like to have dinner on the mall, it can be arranged for us to return from our trip a little later. I haven't worked out the cost yet, but my guess is probably \$40-\$50 for the day. It will depend on the cost of the vans; Please let me know if you are interested via email, snail mail, phone, or whatever. It's never too early to start planning.

Sherm Marsh, Field Trip Chairman

Email: [spmarsh@earthlink.net](mailto:spmarsh@earthlink.net)

Phone: (303) 986-0939

Fax (303) 986-5433

8384 W. Iliff Ave.

Lakewood, CO 80227

## New Members

Let us welcome the following new CSS Members:

James W. Ball  
Donald R. Baker  
Cory Conrad  
David Dethier  
Jennifer Goldsmith  
Bertha T. Gude  
Kathleen A. Marty  
Philip H. Nelson

Emily A. Ness  
William T. Phelps  
Robert E. Stallard  
Thomas C. Sutton  
Michael C. Wall  
Robert R. Willhour  
William L. Wingle



# 1999 Contributions to Memorial & Endowment Funds

The Society thanks its members & friends who contributed a total of \$5,916 to our Memorial and Endowment Funds during 1999. (MF contributions in the memory of others are shown in brackets, whereas an asterisk indicates those contributing \$100 or more.) As of December 31, 1999, the total value of our Memorial Funds investments was roughly \$139,500 (this includes about \$10,400 in interest reserved for the 2000 awards). The Memorial Funds honor the following individuals and have these primary research objectives:

**Ogden Tweto (1984): Field-based earth-science research in Colorado & adjacent areas**

**Stephen Oriel (1986): Geologic studies of the Idaho-Wyoming thrust belt & associated topics**

**Edwin Eckel (1990): Engineering geologic studies in the United States**

**William-Pierce (1994): Studies of the Heart Mountain fault, Wyoming, & associated problems**

**George Snyder (1998): Studies of Precambrian geology & basement tectonics, Rocky Mountain region.**

Since the Memorial Fund Program started in 1984, the Society has awarded 109 student research grants in Earth Sciences for an aggregate value of about \$80,000. The George Snyder Memorial Fund was established in October 1998 with a generous gift of \$10,000 from Sandy Jackson, executor of George's estate. Please remember that your **entire** contribution goes towards generating interest for the grants & that your contribution is 100% tax deductible (the Society is a non-profit Section 501 (c)(3) organization).

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## Memorial Funds (\$5,265)

Ball, Theodore T.  
Barclay, C. S. Venable\*  
Bloom, Adam\*  
Bloome, Claire\*  
Bryant, Bruce H.\*  
Bucknam, Robert C.  
Burgin, Lorraine B.  
Bush, Alfred L. [Richard P. Fischer]  
Butler, Jr., Arthur P.  
Cadigan, Robert A.  
Camp, Nancy Ann  
Campbell, David L.  
Canney, Frank C.

Carr, Wilfred J.  
Chisholm, Hazel I.\*  
[Ogden Tweto]  
Christiansen, Ann C.\*  
Constenius, Kurt N.  
Crone, Anthony J.  
Davis, Robert E.\*  
Eberle, Mary C.  
Erslev, Eric A.\*  
Freeman, Val L.  
Gregson, Joe D.  
Grose, Thomas L. T.  
Hall, Robert B.  
Haun, John D.  
Holden, Gregory S.\*

Ivey, John B.  
Kellogg, Karl S.  
Kish, Stephen A.  
Kopf, Rudolph W.  
Machette, Michael N.\*  
Mackenzie, David B.\*  
MacLachlan, James C.\* & Margorie\*  
Madole, Richard F.  
Mark, Anson  
Moench, Robert H.\*  
Moore, David W.  
Moore, William R.  
Mytton, James W.  
Nichols, Donald R.



Ohl, Jane P.  
Olmore, Stephen D.  
Patton, Priscilla C.\*  
Pearson, Robert C.  
Personius, Stephen F.  
Pierce, Kenneth L.  
Pillmore, Charles L.\*  
[Bob Tschudy]  
Pitkin, James A.\*  
Poole, Forrest G.\*  
[Norm Foster, Peter Coney,  
& Woody Frezon]  
Ratté, James C.  
Reheis, Marith C.  
Reynolds, Mitchell W.\*  
Reynolds, Richard L.  
Rogers, William P.\*  
Royse, Frank\*  
Ruppel, Edward T.  
Savage, William Z.  
Sawyer, Michael B.  
Schmoll, Henry R.

Scott, Glenn R.\*  
Sheppard, Richard. A.  
Siebert, Harry L.  
Smith, Marjorie C.\*  
Stein, Holly J.  
Swayze, Gregg A.  
Thordarson, William  
Van Gosen, Bradley S.  
Weitz, Joseph L.  
Wickham, Benjamin N.\*  
Wickham, John and Mary Lou\*  
Williams, Paul L.  
Witkind, Irving J. [J. Fred Smith]  
Wobus, Reinhard A.  
Yount, James C.\*  
Zeller, Howard D.  
Zielinski, Robert A.

**Endowment Fund (\$651)**

Anderson, R. Ernest  
Barclay, C. S. Venable\*  
Burgin, Lorraine B.

Calkin, Parker E.  
Canney, Frank C.  
Clebsch, Jr., Alfred  
Curtis, Graham R.  
Duke, III, H. Benjamin  
Ellis, William L.  
Finch, Warren I.  
Hannah, Judith L.  
Lidke, David J.  
Mackenzie, David B.  
Madole, Richard F.  
McGrew, Jay L.  
O'Sullivan, Robert B.  
Ohl, Jane P.  
Pitkin, James A.  
Poole, Forrest G.  
Schmoll, Henry R.  
Smith, Marjorie C.  
Thordarson, William  
Tuttle, Michele L.  
Weitz, Joseph L.  
Yount, James C.

## CSS- 2000 Speaker Program

Here is a list of upcoming speakers at CSS Meetings, something to look forward to:

**April 20- Peter Lipman:** Blasts from the past: when there were huge volcanoes in Colorado.

**Lang Farmer:** The Sierra Nevada, California- An example of Bottom-Down Mountain Building.

**May 18- Ren Thompson:** The self-destructive nature of middle-latitude Andean volcanoes.

**Art Snoke:** Geologic Evolution of Tobago, West Indies

**October 19- Kathy Nagy and John McCray:** (Titles to be announced)



# Earth Science Meetings and Talks

**Colorado Scientific Society's** regular meetings are held the third Thursday of the month (unless otherwise advertised). Social time begins at 7:00 p.m. and presentations start at 7:30 p.m. For information, contact Mark Hudson at (303) 236-7446 or [mhudson@usgs.gov](mailto:mhudson@usgs.gov).

**Denver International Petroleum Society (DIPS)** meets the 2<sup>nd</sup> Friday of each month at the Wynkoop Brewing Co., 18<sup>th</sup> and Wynkoop Streets. Reception begins at 11:30 a.m., luncheon at 12 p.m., program at 12:30 p.m. 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. For information contact Jim Piper, (303) 932-0134, or the website <http://www.dregs.org>.

**Colorado School of Mines Lectures** -For Heiland Lectures at 4:00 p.m. on Fridays, contact Michelle Szobody (303) 273-3451. For information on Van Tuyl Lectures, call the Dept. of Geology at (303) 273-3800.

**Colorado State University Geology Lectures** -Mondays, 4:10 p.m. in room 109 or 316 of the Natural Resources Building. Call the Dept. of Earth Resources at (970) 491-5661 for further details.

**University of Colorado at Boulder, Geological Sciences Colloquium**  
Wednesdays, 4:00-5:30 p.m., Rm. 180. For schedule, contact Kathy Madsen 303-492-8141.

## **U. S. Geological Survey, Geologic Division Colloquium**

Thursday, March 16: **Dennis O'Leary**- "Terrain processes on the Atlantic continental slope"

Thursday, March 23: **Karl Kellogg**- "Latest thoughts on the Laramide and Tertiary history of the Gore and Western Front Ranges, Colorado"

Thursday, March 30: **Marith Reheis**- "Pleistocene assembly of the upper Humboldt River: An outrageous hypothesis"

Bldg 20, Denver Federal Center, Thursdays, 1:30-2:30 p.m., Foord Conference Room.  
For a more complete schedule, contact Margaret Hiza: (303) 236-0075.





# COLORADO SCIENTIFIC SOCIETY

## 2000 DUES AND MEMORIAL FUND CONTRIBUTIONS

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(Last Name)                      (First Name)                      (Initial)                      (Telephone)

\_\_\_\_\_ o Check if new address information

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**I WOULD LIKE TO RECEIVE THE NEWSLETTER BY EMAIL AS A PDF FILE (IN LIEU OF A PAPER COPY) AND SAVE THE SOCIETY TIME, MONEY, AND A FEW TREES.**

**DUES:** Dues are for the calendar year and help support the monthly meetings and newsletter, field trips, family night, student night, and the annual Emmons Lecture.

Regular Members (\$15) ..... \_\_\_\_\_  
 Corresponding Members (\$10)..... \_\_\_\_\_  
 Student Members (\$5) ..... \_\_\_\_\_

**MEMORIAL FUNDS:** Supports earth-science research grants to graduate students.  
 If not specified as to the fund, contribution will be distributed equally:

(A) Ogden Tweto Memorial Fund ..... \_\_\_\_\_  
 (B) Steven Oriel Memorial Fund ..... \_\_\_\_\_  
 (C) Edwin Eckel Memorial Fund ..... \_\_\_\_\_  
 (D) Bill Pierce-Heart Mountain Fund ..... \_\_\_\_\_  
 (E) George Synder Memorial Fund ..... \_\_\_\_\_

This contribution in memory of \_\_\_\_\_

**ENDOWMENT FUND:** Funds are used to support the Society's operations and special activities:..... \_\_\_\_\_

**TOTAL CONTRIBUTION (DUES AND FUNDS):** ..... \_\_\_\_\_

Please make your dues and/or contribution checks payable to the Colorado Scientific Society and specify the Fund(s) to which you are contributing.

All Colorado Scientific Society activities depend on volunteer help. Please mark those activities that you can help with. We will pass your name on to the appropriate Committee Chairperson.

Audio Visual   Fund Raising   Newsletter   Science Fair   Geologic Signs   History   Sci. Program  
 Student Night   Field Trips   Membership   Publicity   Web Site

Send this form & your check to:

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





## Colorado Scientific Society Officers, Councilors, and Chairpersons

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**President-Elect:** Michele Tuttle, USGS, 273-8626  
**Treasurer:** Michael N. Machette, USGS, 273-8612  
**Secretary:** Stephen F. Personius, USGS, 273-8611  
**Past President:** Ken Pierce, USGS, 236-1244

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**Best Paper Award:**  
**Field Trips:**  
**History:**  
**Membership:**  
**Memorial Funds:**  
**Memorial Funds Treasurer:**  
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**Program:**  
**Publicity:**  
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**Ken Pierce, USGS, 236-1244**  
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**David Moore, USGS, 236-1271**  
**Bill Wingle, CSM, 273-3905**  
**Lee-Ann Bradley, USGS, 273-8613**

**\*\* NOTE: Please help us with publicity by posting copies of the Newsletter on bulletin boards.**

