

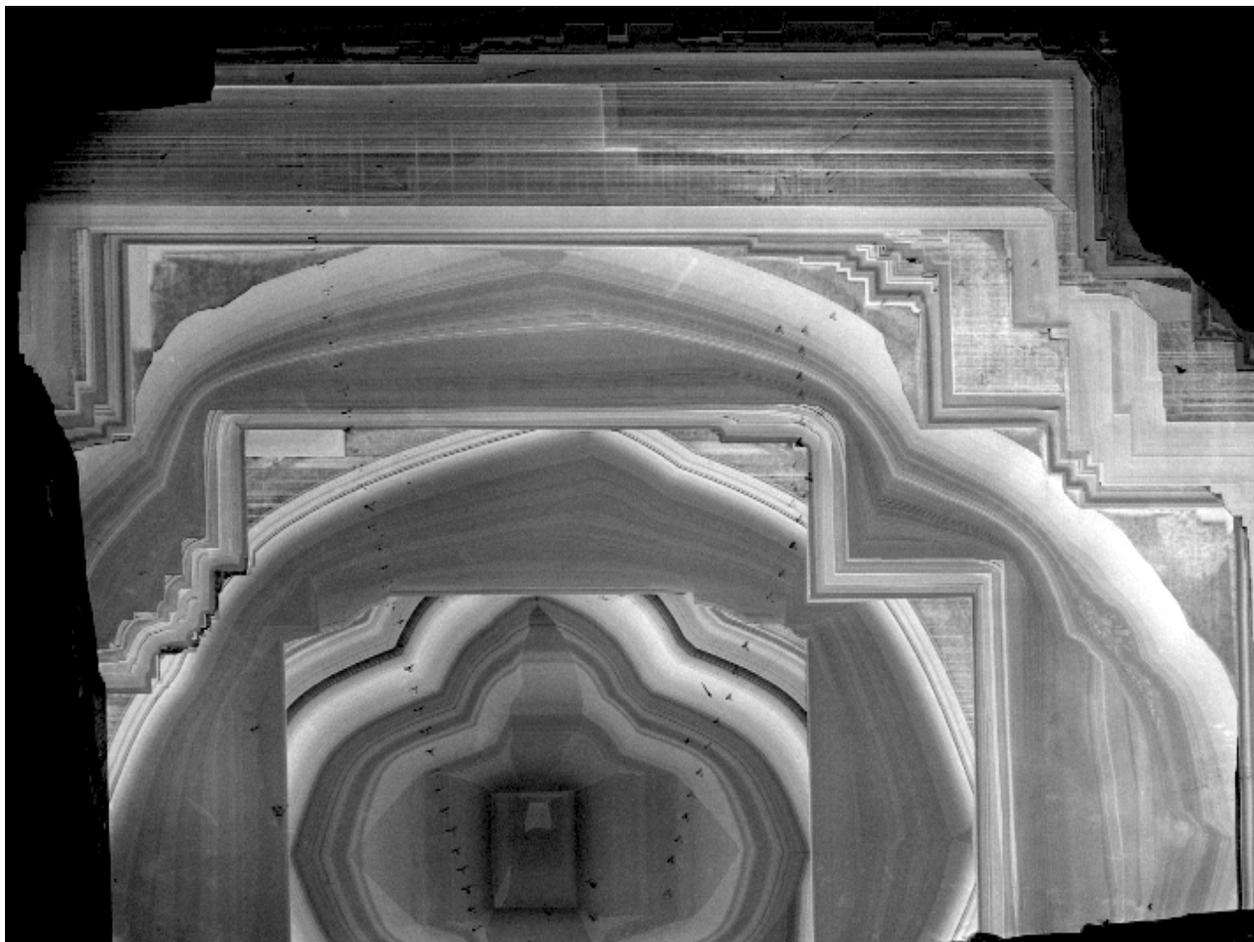
# ***THE GEOCHEMICAL NEWS***

***Newsletter of The Geochemical Society  
In Cooperation With  
The European Association of Geochemistry***

**NUMBER 108**

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**JULY 2001**



## **Goldschmidt 2002 FROM STARS TO LIFE**

**August 20-28  
Davos, Switzerland**

<http://www.goldschmidt-conference.com/gold2002/>

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## THE GEOCHEMICAL SOCIETY

The **Geochemical Society** is a nonprofit scientific society founded to encourage the application of chemistry to the solution of geological and cosmological problems. Membership is international and diverse in background, encompassing such fields as organic geochemistry, high and low-temperature geochemistry, petrology, meteoritics, fluid-rock interaction, and isotope geochemistry. The Society produces a *Special Publications Series*, *The Geochemical News* (this newsletter), the *Reviews in Mineralogy and Geochemistry Series* (jointly with the Mineralogical Association of America), the journal *Geochimica et Cosmochimica Acta* (jointly with the Meteoritical Society), and co-publishes the electronic journal *G<sup>3</sup>* (jointly with the American Geophysical Union); grants the **V.M. Goldschmidt, F.W. Clarke and Clair C. Patterson Awards**, and, jointly with the European Association of Geochemistry, the **Geochemistry Fellows** title; sponsors the **V.M. Goldschmidt Conference**, held in North America in odd years and elsewhere in even years, jointly with the European Association of Geochemistry; and co-sponsors the Geological Society of America annual meeting and the American Geophysical Union spring meeting. The Society honours first President, F. Earl Ingerson, and our first Goldschmidt Medalist, Paul W. Gast, with the **Ingerson and Gast Lectures**, held annually at the Geological Society of America Meeting and the V.M. Goldschmidt Conference, respectively. The Geochemical Society is affiliated with the American Association for the Advancement of Science and the International Union of Geological Sciences.

Members of the **Organic Geochemistry Division** are individuals with interests in studies on the origin, nature, geochemical significance, and behavior during diagenesis and catagenesis of naturally occurring organic substances in the Earth, and of extraterrestrial organic matter. GS members may choose to be affiliated with the OGD without any additional dues. The OGD presents the **Alfred E. Treibs Award** for major achievements in organic geochemistry, and **Best Paper** awards (student and professional) in organic geochemistry.

## Editors' Corner

Farewell, readers. This is the last issue that I will edit. Please submit all further contributions to the new Editors (see p. 3).

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### ASSISTANT EDITOR

*Dolores Sturchio, Naperville, Illinois (USA)*

## WHAT'S IN A NAME?

### A proposal to rename the Organic Geochemistry Division

The following is a discussion of an idea that the time may be appropriate to consider a name change for the Organic Geochemistry Division (OGD) of The Geochemical Society (GS) to the Organic Geoscience Division (same initials) of The GS.

Why would one make such a suggestion? The answer lies in perception, not reality. Organic geochemistry is perceived by many as a rather narrowly focused discipline dealing mainly with petroleum geochemistry and molecular organic geochemistry, when, in fact, it really is a much broader discipline that includes subject matter such as biogeochemistry and organic cosmochemistry.

The current perception results from the historical development of the organization. Organic Geochemistry was formally organized and recognized as a geoscience some 40 years ago. It was built, in part, upon the nascent field of petroleum geochemistry, which held its first organized meeting in June of 1959 during the 5<sup>th</sup> World Petroleum Congress in New York City. That meeting "General Petroleum Geochemistry Symposium," convened at Fordham University, was followed four years later by a Gordon Research Conference "Origin of Petroleum," held at Tilton School, New Hampshire in 1963. Meanwhile, the Organic Geochemistry Division (OGD) was formed in November 1960 on the occasion of the annual meeting of the Geological Society of America in Denver, Colorado.

By early 1961, OGD was recognized as an integral part of The Geochemical Society. In September 1962, the 1<sup>st</sup> International Meeting on Organic Geochemistry was held in Milan, Italy. There have now been 19 International Meetings, the last in Istanbul, Turkey (1999); the 20<sup>th</sup> International Meeting will be held in September 2001 in Nancy, France. Gordon Research Conferences devoted specifically to organic geochemistry began in 1968 and have been held every other year since at Holderness School, New Hampshire.

A journal, *Organic Geochemistry*, was established in 1977 and became affiliated with the European Association of Organic Geochemists (EAOG) in 1983. In 1988, this publication was designated the official Journal of EAOG, and it continues to be published by Elsevier.

Within this rich history has come change, the most important being the increasing interest in biogeochemistry. Other international geoscience organizations have recognized this need to include biosciences. For example, the American Geophysical Union has last year formally established a Biogeosciences Section. This year the Geological Society of America formed the Division of Geobiology and Geomicrobiology. All of these new organizational structures clearly are encompassed in the term "organic geoscience."

Therefore, I suggest that the community of organist geochemists become the community of organic geoscientists, embracing all geoscientists who deal with organic materials, both living and dead. Given the broader charter, as reflected in the new name, Organic Geoscience, the current perception of Organic Geochemistry may be greatly broadened.

Organic Geochemistry was the first of the Organic Geo-

sciences. Because of the current perception and the current reality of what Organic Geochemistry is, I suggest that serious consideration be given to changing the name of Organic Geochemistry to Organic Geoscience. Such a change will need to be acceptable to the members of the Organic Geochemistry Division, adopted by the Executive Committee of OGD, and approved by The Geochemical Society. I firmly believe that the proposed change in name should be discussed and considered now.

Keith A. Kvenvolden  
U.S. Geological Survey  
345 Middlefield Road, MS 999  
Menlo Park, CA 94025  
650-329-4196  
kkvenvolden@usgs.gov



### The Sixth International Symposium on the Geochemistry of the Earth's Surface (GES-6)

May 20-24, 2002  
Honolulu, Hawaii, USA

#### Sponsors:

School of Ocean & Earth Sciences & Technology  
of the University of Hawaii  
International Association of Geochemistry and Cosmochemistry

#### Interested parties should contact:

Dr. Fred Mackenzie  
SOEST, University of Hawaii  
Department of Oceanography  
1000 Pope Road  
Honolulu, HI 96822, USA

Phone (808) 956-6344  
FAX (808) 956-7112  
fredm@soest.hawaii.edu

## From the President

### Goldschmidt 2001, Hot Springs, Virginia, USA

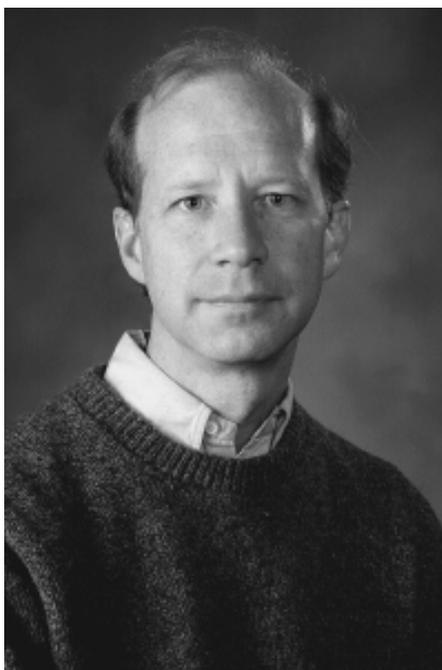
The Goldschmidt Conference for 2001 was held from May 20 to 24 in Hot Springs, Virginia at The Homestead. Bob Bodnar and I, co-conveners of the meeting, are delighted to report that 925 scientists from 29 countries attended the meeting, making this by far the largest Goldschmidt Conference ever in the United States. With some 720 talks and 160 posters, there was a lot going on in four and a half days. But I think most importantly, Bob and I received well over 100 comments praising the quality of the presentations, including highly positive comments from NSF and DOE managers. Such is the mark of an outstanding meeting, and we have the membership of the GS, EAG, and MSA, plus many others, to thank for making this meeting such a success. Also at the top of our thank you list are Ellen Mathena, Conference Secretary from Virginia Tech, the conference staff of the Lunar and Planetary Institute in Houston, Texas, the Executive Planning Committee, the conveners of the 41 topical sessions, and the superb A/V staff led by Charles Farley.

We are also happy to report that Goldschmidt 2001 was on budget, and as a result, at the break-even point. Those that organize these conferences work very hard to make sure that they are self-supporting and not a drain on Society monetary resources. However, all Goldschmidt meetings receive donations that are invaluable to the quality of the meeting. This year, the donors were (in alphabetical order) Blackwell, the Department of Geological Sciences at Virginia Tech, Finnigan MAT, the Geochemical Society (student support), the Lunar and Planetary Institute, Micromass, the Mineralogical Society of America (student support), and Thermo Elemental. It is a great pleasure to publicly name these donors, and thank them for their kind generosity.

### So what's in a Goldschmidt Conference?

In my opinion, the Goldschmidt Conference has grown and matured over the years into the premiere annual meeting for geochemists internationally. Through this meeting, geochemists, defined in the broadest sense, have come together from every continent to claim scientific ground for the future. In effect, the vitality and energy of this meeting defines who we are. And because of this, we have only seen the beginning of what this meeting can do for science and this community of scientists. I applaud the tremendous efforts of all past Goldschmidt originators, organizers, and participants, and we should all look forward to riding the wave of Goldschmidt meetings well into the future.

The next Goldschmidt is still over a year away (August



18-23, 2002), but principal organizers Alex Halliday (ETH), Jan Kramers (Bern), and Rainer Wieler (ETH) and many others have been hard at work for well over a year to make this meeting another great success. And it will be just that. The meeting will be held in the beautiful Alpine resort town of Davos, Switzerland. I have been to a meeting there before, and I thought that the facilities and surroundings were truly spectacular. Alex has assembled a new International Program Committee and a Goldschmidt Conference Organizing Committee that are dedicated and will leave nothing to chance. The scientific range of the meeting will be as broad as ever. Block out that week on your calendars and expect a superbly run Goldschmidt, an innovative scientific program, and lots of presentations (I expect that this will be the largest Goldschmidt ever, in the States or in Europe). The bottom line is that this meeting will be special, and as they say, you won't want to miss it.

### The 2001 Board of Directors Meeting

The Board of Directors of the Geochemical Society consists of 16 members, ten of which are officers of the Society in some capacity (the President, Vice-president, Secretary, Treasurer, and so on), plus six non-officer directors. The members of this Board of Directors correspond with each other concerning Society business on a year-round basis. However, the Board only meets as a group once each year, the day before the Goldschmidt meeting begins. The meeting this year took place on May 19 in Hot Springs, Virginia and lasted about eight hours. Linda Tanner, GCA editorial manager, took detailed notes at this meeting, and these are presented elsewhere in

this issue of *The Geochemical News*.

Insofar as this Board meeting is the most important administrative activity of the Society each year, I list below a few points of the meeting that I think were particularly important. But it is impossible to summarize all of the important workings of this Society in such a short space. I encourage you to read the meeting minutes in their entirety.

- Eiichii Takahashi of Tokyo Institute of Technology, and our International Secretary, is helping us finally make inroads into Japan and their very large and active geochemical community. Dr. Takahashi is organizer of a Geochemical Society short course on isotope geochemistry, to be held in conjunction with the annual meeting of the Geochemical Society of Japan this October. And don't forget that the 2003 Goldschmidt conference will be in Kurashiki, Japan.
- Membership in the GS is up for the first time in several years. Thanks go especially to our Business Manager, Seth Davis of Washington University in St. Louis, USA for an excellent membership campaign.
- The production of *Geochimica et Cosmochimica Acta* is the single most important job of this Society. The journal, under

the leadership of Frank Podosek of Washington University, is in great shape. Submissions are up, quality remains high (the impact factor of this journal is by far the highest among geochemistry and mineralogical journals and is equivalent to *Earth and Planetary Science Letters*), and the production schedule of the journal remains on time.

- The first Geochemical Society contribution to the *Reviews in Mineralogy and Geochemistry* series (formally *Reviews in Mineralogy*) has been released and was on sale in Hot Springs at the Goldschmidt conference. The volume is entitled "Molecular Modeling Theory and Applications in the Geosciences", edited by Randy Cygan and Jim Kubicki. The GS RiM&G editorial and production manager, Jodi Rosso, did a superb job at producing this book. This formally launches our collaboration with MSA and their 25 years of experience with a series of this type, not to mention the 200,000+ books that they have already sold.

#### Farewell to GN Editor Sturchio

Neil Sturchio is stepping down as Editor of the Geochemical News after having served in this role for the past four years. Neil has worked tirelessly to bring the GN to what it is today, perhaps the best newsletter of any small scientific society within the earth sciences. His service to the Society has been absolutely invaluable, and the time that he has devoted to this endeavor has been great. We wish him the very best in his post-GN career. Thanks, Neil!!

Professors Johnson Haas and Carla Koretsky of Western Michigan University will take over as co-editors of the GN starting with the next issue. They have many new ideas that will continue to improve this publication, and I look forward to their contributions to the Geochemical Society over the next several years.

And finally, as usual, if something is on your mind concerning the GS, don't hesitate to let me know about it. You can find me at hochella@vt.edu.

Best regards to all,

*Mike Hochella*  
*President of the Geochemical Society*

#### Geochemical Society Business

Please address all inquiries and correspondence to the Geochemical Society's business manager:

Seth Davis  
Earth & Planetary Sciences  
Washington University  
One Brookings Drive, Box 1169  
St. Louis, MO 63130, USA  
Tel. 314-935-4131; Fax. 314-935-4121  
e-mail: office@gs.wustl.edu

**The 3rd International Limnogeology Congress (ILIC)** sponsored by the International Association of Limnogeologists (IAL) will be held from **29 March to 2 April, 2003, in Tucson, Arizona, USA** at the Presidio Plaza Hotel. The organizing committee at the University of Arizona invites all interested participants to submit proposals for theme sessions and field trips. A first circular, describing the meeting venue and general plans for the Congress will be circulated by mailings and electronically later in 2001.

#### Contacts:

Theme session proposals should be sent to Andrew Cohen, general chair of the Congress. Dept. of Geosciences, University of Arizona, Tucson, AZ 85721. Tel: 1-520-621-4691. Fax: 1-520-621-2672. E-mail: acohen@geo.arizona.edu

Field trip proposals should be sent to David Dettman, field trip coordinator. E-mail: Dettman@geo.arizona.edu

For further information concerning housing and registration, please contact Noah Lopez. E-mail: noahl@u.arizona.edu

#### Visit the Online Goldschmidt Survey!

Have you attended a Goldschmidt meeting in recent years? Do you plan to attend one in coming years? And if you haven't, why not? We invite you to visit our online meeting survey and register your opinions, at:

<http://unix.cc.wmich.edu/~jhaas/survey.html>

Goldschmidt meetings are becoming more and more popular; nearly 1000 participants took part in the most recent meeting in Hot Springs, VA! We want these meetings to keep growing and to continue to provide the Geochemical Society membership with a fantastic yearly forum. Help the volunteers who organize these meetings to tailor them to our needs by filling out the survey. Results will be compiled and published in the next issue of *The Geochemical News*.

#### Want to host a Goldschmidt Conference?

Proposals are now being accepted for the 2005 conference to be held at a USA location. Contact the GS office with your ideas (office@gs.wustl.edu). The proposed venue must allow for state-of-the-art technical presentations and accommodations for 1000+ geochemists, ideally in a scenic location.

upcoming Goldschmidt conferences:

2002 - Davos, Switzerland

2003 - Kurashiki, Japan

2004 - Copenhagen, Denmark

### From the Business Office



Seth Davis, GS Business Manager

*Goldschmidt 2001* - The GS booth was much more noticeable and active than last year. I appreciated all of the people, members and officers who stopped by to visit the display and who took a moment to chat with me.

*Membership* - Membership surpassed 1,540 at the end of June, and slowly continues to rise. As I continue the process of recruiting, please help me by sharing your newsletter with a colleague, tell them about your society, or even direct them to the website (<http://gs.wustl.edu>) for more information.

*Subscriptions* - Many subscribers are still having difficulties receiving their back issues from Elsevier Science. Thank you for your continued patience as I strive to get the matter resolved. If it has been more than 10 weeks since you received my notification that your request had been submitted to Elsevier, and you still do not have your back issues, please let me know. Also, if you've noticed that your subscription to this year's volume has a missing issue or two, please let me know and I will get your issues to you.

*Publications* - As I have noted before, GS members receive 25% discounts on the purchase price of the RIM&G volumes (sold by MSA) as well as all MSA membership discounted materials. An order form is available elsewhere in this newsletter or at the MSA web site at <http://www.minsocam.org>

*Ideas?* - Any suggestions regarding the Geochemical Society, its services, or sponsorships? Any events going on you think members should know about? Send a letter to the business office at [gsoffice@gs.wustl.edu](mailto:gsoffice@gs.wustl.edu).

Sincerely,

Seth Davis  
GS Business Manager  
Washington University  
Earth and Planetary Sciences  
One Brookings Drive, CB 1169  
St. Louis, MO 63130-4899, USA  
Ph. 314-935-4131  
Fx. 314-935-4121  
E-mail. [gsoffice@gs.wustl.edu](mailto:gsoffice@gs.wustl.edu)

### Haas and Koretsky to Assume GN Editorship



Johnson Haas

Carla Koretsky

We first offer our thanks to departing Editor Neil Sturchio for serving so ably as editor of *The Geochemical News* for the past four years, and it is with mingled feelings of honor, enthusiasm and trepidation that we accept his nomination, with the support of the President and the Board of the Geochemical Society, to joint editorship of *The Geochemical News*. Neil's example will be difficult to follow. Under his leadership GN has grown from a biannual to a quarterly publication, offering a wide array of news, articles, features and interviews. On our watch we plan to build on this example, adding some new features and inviting the contribution of ideas, review articles and original science journalism from our increasingly diverse and interdisciplinary membership. We strongly encourage our younger colleagues, including students, to contact us with ideas and articles. Don't be shy! We plan to add a section spotlighting professional, postdoctoral and student research/employment opportunities in geochemistry. Send us your ads! We intend to offer more interviews with leaders in our field, to promote features showcasing some of the world's leading and upcoming centers of geochemical research, and to develop more coverage of news and current events relating to the geochemical sciences, especially from our colleagues in Europe and Asia. Geochemists study a global system, and so our discourse must be equally cosmopolitan. We look ahead into a new century where global geopolitical and environmental issues, the relentless climb of technology, and the search for life elsewhere in the cosmos inch (centimeter?) geochemistry and biogeochemistry closer to the foreground of public thought. As this transition begins, we will strive with your help to make GN a leading voice for our Society, our profession, and our discipline.

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## The Geochemical Society 2002 Awards Nominations

(Nominations will be separately called for the Alfred Treibs  
Award of the Organic Geochemistry Division)

### V.M. Goldschmidt Award

The V.M. Goldschmidt Award shall be made for major achievements in geochemistry or cosmochemistry, consisting of either a single outstanding contribution, or a series of publications that have had great influence on the field. The award will normally be given annually at the V.M. Goldschmidt Conference. Current members of the Geochemical Society Board of Directors and past recipients of the award are ineligible for nomination. Nominations should specify the name, address, and chief fields of specialization of the nominee, and be accompanied by a curriculum vitae and bibliography of the nominee, limited to two pages each, and up to three supporting letters. Nominations should also be accompanied by a letter from the nominator giving name, address, phone number, signature, and a brief summary of why the candidate is suitable for the award. Awards are based solely on scientific merit, without regard to citizenship or membership in the Society.

**Past Recipients:** P.W. Gast (1972), R.M. Garrels (1973), H.E. Suess (1974), H.C. Urey (1975), H.P. Eugster (1976), S. Epstein (1977), G.J. Wasserburg (1978), H. Craig (1979), C.C. Patterson (1980), R.N. Clayton (1981), K.B. Krauskopf (1982), S.S. Goldich (1983), A.O. Nier (1984), J.B. Thompson (1985), C.J. Allégre (1986), W.S. Broecker (1987), H.C. Helgeson (1988), K.K. Turekian (1989), E. Anders (1990), A.E. Ringwood (1991), S.R. Hart (1992), S.R. Taylor (1993), H.D. Holland (1994), R. Berner (1995), A.W. Hofmann (1996), D. Lal (1997), W. Stumm (1998), J.L. Bischoff (1999), G. Eglinton (2000), I. Kushiro (2001)

**Nominations for the 2002 V.M. Goldschmidt Award should be submitted before November 15, 2001, to:**

Dr. Bernard J. Wood                      Tel: 44-117-9545422  
Dept. Earth Sciences                      Fax: 44-117-9253385  
Queen's Rd., Wills Memorial Bldg.      Email: b.j.wood  
Bristol, BS8 1RJ                              @bristol.ac.uk  
UK

### F. W. Clarke Award

The F.W. Clarke Award shall normally be made annually at the V.M. Goldschmidt Conference to an early-career scientist for a single outstanding contribution to geochemistry or cosmo-chemistry, published either as a single paper or a series of papers on a single topic. Eligibility for this award is met if either of the following criteria is satisfied on the first day of the year in which the award is given: (a) the candidate must have received a recognized doctorate or its equivalent within the last six (6) years; or (b) must not have celebrated their thirty fifth (35th) birthday. Current members of the Board of Directors and past recipients of the award are ineligible for nomination. The Clarke and Patterson medals cannot be awarded for the same accomplishment. Nominations should specify the name, address, and chief fields of specialization of the nominee, and be accompanied by a copy of the paper(s) for which the nominee is being considered for the award, and up to three supporting letters. Nominations should also be accompanied by a letter from the nominator giving name, address, phone number, and signature, together with a brief statement explaining the significance of the nominee's work. This letter should also specify the nominee's date of birth and final degree received, the degree advisor's name, the year granted, and the name of the granting institution. Awards are based solely on scientific merit, without re-

gard to citizenship or membership in the Society.

**Past Recipients:** D.A. Papanastassiou (1972), H. Ohmoto (1973), L. Grossman (1974), D. Walker (1975), J.R. Wood (1976), B. Mysen (1977), D.J. DePaolo (1978), A.C. Lasaga (1979), R.W. Potter (1980), J.F. Minster (1981), P.J. Patchett (1982), E.B. Watson (1983), A. Mackenzie (1984), E.M. Stolper (1985), M.D. Kurz (1986), E. Takahashi (1987), F.M. Phillips (1988), R.J. Walker (1990), D. Sherman (1991), E. Klein (1992), Y Zhang (1993), C. Agee (1994), R. Lange (1995), P.M. Dove (1996), J. Blundy (1997), M. Humayun (1998), A.M. Scheidegger (1999), J. Farquhar (2000), C.C. Lundstrom (2001)

**Nominations for the 2002 F.W. Clarke Award should be submitted before November 15, 2001, to:**

Dr. Margaret L. Delaney                      Tel: 1-831-459-4763  
Ocean Sciences                              Fax: 1-831-459-4882  
1156 High Street                              Email: Delaney@  
University of California                      cats.ucsc.edu  
Santa Cruz, CA 95064 USA

### Clair C. Patterson Award

The Clair C. Patterson Award, for a recent innovative breakthrough in environmental geochemistry of fundamental significance, published in a peer-reviewed journal, will normally be made annually at the V.M. Goldschmidt Conference. The award has no age or career stage restrictions, but the Clarke and Patterson medals cannot be awarded for the same accomplishment. Current members of the Geochemical Society Board of Directors and past recipients of the award are ineligible for nomination. Nominations should include the name, address, and chief fields of specialization of the nominee, and be accompanied by a curriculum vita of not more than two pages, a list of no more than 10 peer-reviewed publications relevant to the accomplishment being recognized, and up to three support letters. Nominators should include a letter of not more than two pages, giving name, address, phone number, signature, and a brief description of the nominee's contribution to environmental geochemistry. Awards are based solely on scientific merit, without regard to citizenship or membership in the Society.

**Past Recipients:** M.L. Bender (1998), R.L. Edwards (1999), E.A. Boyle (2000), F. M.M. Morel (2001)

**Nominations for the 2002 Clair C. Patterson Award should be submitted before November 15, 2001, to:**

Dr. Lynn M. Walter                              Tel: 1-734-763-4590  
University of Michigan                      Fax: 1-734-763-4690  
2534 C.C. Little Bldg.                      Email: lmwalter  
Ann Arbor, MI 48109                      @umich.edu  
USA

*Please take the time to honor your deserving friends and colleagues! It is up to you, as members of the Geochemical Society, to ensure that all of geochemistry is recognized, and all geochemists are considered!*

visit the Geochemical Society web site!  
<http://gs.wustl.edu>

## Call for Nominations for 2002 Joint EAG-GS Geochemistry Fellows

The European Association for Geochemistry (EAG) and the Geochemical Society (GS) established in 1996 the honorary title of Geochemistry Fellow, to be bestowed upon outstanding scientists who have, over some years, made a major contribution to the field of geochemistry. Existing and new Urey, Goldschmidt and Treibs Medal winners become Fellows automatically. Up to 10 new Fellows will be elected each year. Membership in either organization is not a factor in consideration of Fellows candidates. Current members of the Fellows Selection Committee, the GS Board of Directors, and the EAG Council are ineligible for nomination. Any member of either organization may nominate Fellows by right.

Nominations should include the name, address, telephone number and email address of the nominee, a citation of no more than two pages describing the contributions the individual has made to geochemistry, and up to three letters of support from members of either society. The nomination should also include the nominator's name, address, telephone number, and signature. **Submission by attached files to email is strongly encouraged, although signed originals of documents must also be submitted by conventional mail.**

**Nominations should be sent no later than November 15, 2001 to:**

Dr. Harry Elderfield  
Earth Sciences  
Cambridge University  
Downing Street  
Cambridge, CB2 3EQ U.K.

Tel. 44-1223-333406  
Fax: 44-1223-333450  
Email: he101@esc.cam.ac.uk

Geochemistry Fellows (excluding Urey, Goldschmidt, and Treibs Medalists)

**1996** William Compston, Willi Dansgaard, John Edmond, John M. Hayes, Marc Javoy, Ho-Kwang Mao, Stephen Moorbath, John Reynolds, Jean-Guy Schilling, Nick Shackleton, Mitsunobu Tatsumoto, Werner Stumm, George Tilton, Grenville Turner, Heinrich Wänke, William White

**1997** Philip Abelson, Jan Bottinga, Ian Carmichael, Donald J. DePaolo, Bruno J. Giletti, Tom Krogh, Ikuo Kushiro, Gunter W. Lugmair, Fred T. Mackenzie, Alexandra Navrotsky, Michael O'Hara, Keith O'Nions, Denis M. Shaw, Edward M. Stolper, George W. Wetherill, Derek York

**1998** Thomas J. Ahrens, Francis Albarede, Michael L. Bender, Edward A. Boyle, Eric M. Galimov, John I. Hedges, Miriam Kastner, Yehoshua Kolodny, Charles H. Langmuir, Antonio C. Lasaga, James R. O'Neil, George Parks, James C.G Walker, David Walker, E. Bruce Watson, Bernard J. Wood, Jan Veizer, Ernst Zinner

**1999** Hubert L. Barnes, Gordon E. Brown, C. Wayne Burnham, William S. Fyfe, Nobumichi Shimizu

**2000** Harry Elderfield, Gunter Faure, Fred A. Frey, Gilbert Hanson, Frank J. Millero, Francois M. Morel, Minoru Ozima, Douglas Rumble II, Terry M. Seward, G. Alan Zindler

**2001** A.N. Halliday, C.J. Hawkesworth, W.J. Jenkins, B.B. Joergensen, I. Tolstikhin, R. Wollast

## Alfred Treibs Award Nominations

Nominations for the Alfred Treibs Award, sponsored by the Organic Geochemistry Division of The Geochemical Society will be accepted between January 1 and June 1 each year for presentation during the following year. This award, consisting of a gold-plated medal and certificate, is awarded for career achievements, over a period of years, in organic geochemistry. Such achievements consist of pioneering and innovative investigations which have made highly significant contributions to the understanding of the origin and fate of organic materials in the geosphere and/or in extraterrestrial environments.

Past Recipients:

G.T. Philippi (1979)  
B. Tissot (1980)  
G. Eglinton (1981)  
J.M Hunt (1982)  
D.H. Welte (1983)  
W.K. Seifert (1984)

P. Albrecht (1985)  
T.C. Hoering (1987)  
James R. Maxwell (1989)  
Jan W. de Leeuw (1991)  
Isaac R. Kaplan (1993)  
Keith A. Kvenvolden (1995)

Patrick LeGrand Parker (1996)  
John M. Hayes (1997)  
John I. Hedges (1999)  
John Smith (2000)

To be considered for the current year's Treibs award, complete nomination packages, consisting of hard paper copies, must be received by June 1 of this and subsequent years. Nomination packages received later will be considered for the award in the following year. Nomination packages must include six hard copies of each of the following:

- 1) a nominating letter describing the career achievements of the nominee,
- 2) 3-5 additional letters supporting the nomination,
- 3) the nominee's curriculum vitae, not to exceed 2 pages, and
- 4) a list of the nominee's most relevant publications, not to exceed 2 pages.

All files will remain active for 3 years. After that time, the nominator will be required to request that the file remain active for an additional 3 years, or the nominator may submit a new or revised nomination. All submissions will be acknowledged. Only complete nomination packages (containing all materials described in 1-4 above) will be accepted. Complete nominations packages should be sent to:

Dr. Peggy Ostrom, Secretary of the OGD  
206 Natural Science Building  
Dept. of Geological Sciences  
Michigan State University  
East Lansing, Michigan 48824-1115  
Office: 1-517-353-9768; Lab: 1-517-353-5988; Fax: 1-517-353-8787

## THE GEOCHEMICAL SOCIETY 2002 Officer and Director Candidates

The Geochemical Society has a 16-member Board of Directors, currently composed of 10 Officer-Directors and 6 Non-officer Directors. Vice President Judith McKenzie will replace current President Michael F. Hochella, Jr., on January 1 of 2002, and a new Vice Presidential Candidate must be selected. Secretary David J. Wesolowski will also step down at the end of 2001, as will Directors Everett L. Shock and K. Vala Ragnarsdottir. The slate of new officer and director candidates is listed below.

The By-Laws of the Geochemical Society require that its members be notified of the candidates for new Officers and Directors (who are proposed by the Nominations Committee and approved by the Board of Directors of the Society) well before the end of the calendar year in which the current Officers' and Directors' terms expire. The purpose is to allow the general membership to nominate additional candidates for those positions that are up for election. Please consider the candidates listed below carefully and propose others only if you feel this is in the best interest of the Society.

Additional nominations may be made by at least ten (10) members of the Society and the nominees must agree to serve if nominated. **If you are satisfied with the proposed slate of Officers and Directors for 2002, do nothing. Additional nominations must be submitted by September 1, 2001**, to the Secretary of the Geochemical Society (David J. Wesolowski, Chemical and Analytical Sciences Division, Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, Tennessee, 37831-6110, USA (Tel: 1-865-574-6903; Fax: 1-865-574-4961; Email: dqw@ornl.gov).

Proposed Slate of new Officers and Directors of the Geochemical Society:

*Vice President*

James I. Drever  
Dept. Geology and Geophysics  
University of Wyoming  
Laramie, WY, USA

*Secretary*

Jeremy B. Fein  
Dept. Civil Eng. and Geological Sciences  
University of Notre Dame  
Notre Dame, IN, USA

*Directors*

Eric H. Oelkers  
Laboratoire de Geochemie  
CNRS/University Paul Sabatier  
Toulouse, France

Erwin Suess  
GEOMAR Res. Ctr. for Marine Geosciences  
Kiel University  
Kiel, Germany

## The Geochemical Society

### Minutes of the 2001 Board of Directors Annual Meeting

The meeting convened at The Homestead, Hot Springs, VA, on May 19, 2001 and came to order at 8:45 AM.

**Present:** Mike Hochella (President), Judith McKenzie (Vice President), Mike Drake (Past President), Becky Lange (Treasurer), Mike Engel (OGD Chair), Frank Podosek (GCA Editor), Eiichi Takahashi (International Secretary), Scott Wood (Special Publications Editor), Thure Cerling (Director), Roberta Rudnick (Director), Ed Shokovitz (Director), Yukihiro Matsuhisa (President, Geochemical Society of Japan), Friso Veenstra (Elsevier Product Manager), Seth Davis (GS Business Manager), Linda Trower (GCA Editorial Manager), and Bob Bodnar (MSA's representative to Goldschmidt 2001).

**State of the Society (President's Report):** Mike Hochella reported that *Geochimica et Cosmochimica Acta* (GCA) is the world's leading geochemical journal and is doing very well under the leadership of Frank Podosek, Executive Editor of GCA. Membership in the Society had been declining in the past five years but is back up again due to the GS Business Manager, Seth Davis. Hochella stated that Davis has been aggressive with the GS membership drive and the Society is fortunate to have Davis as the GS Business Manager.

The newly formed Joint Advisory Committee of the AGU/GS electronic journal *G-cubed* will consist of six members, three appointed by the GS and three appointed by the AGU. The three GS appointed members are Peggy Delaney, Craig Manning and Jim Kubicki.

Hochella was pleased to report that the first GS-produced book in the *Reviews in Mineralogy and Geochemistry* series with MSA has been completed. The book, on molecular modeling in geochemistry, was edited by Randy Cygan and Kim Kubicki, and the GS production editor was Jodi Rosso. The cost of printing one of these books is substantial, but GS will recoup this investment as a result of book sales.

The financial health of the Society is good and the GS is poised for long term financial growth while remaining not-for-profit and providing services to members (GCA, *The Geochemical News*, the GS website, *Reviews in Mineralogy and Geochemistry*, special publications, reduced membership dues and GCA subscription rates for students, student travel grants, membership registration rates to GSA and spring AGU, etc.).

The Geochemical Society, including its role in GCA, includes 3.5 salaried employees and approximately 65 volunteers. The Vice President is responsible for re-staffing most committees and Judith McKenzie is doing an excellent job doing so.

**Vice President Report:** Judith McKenzie reported on the GS Committee replacements for 2001. The goal is to keep a good balance on committees. McKenzie stated that staffing is a difficult task and the list of GS members provided by Davis was extremely useful. Roberta Rudnick said that MSA asks members if they're willing to serve and suggested this option be added to the GS membership application. McKenzie motioned that we accept adding the option of adding a checkbox to the GS mem-

bership application asking members if they're willing to serve and Drake seconded the motion. The Board passed the motion unanimously.

**Nominations Committee Report:** The Board discussed the report of the Nomination Committee whose job it is to set before the Board suggestions for nominees for new officers and non-officer Directors. Based on this and discussion which followed, Mike Drake motioned to select James "Tim" Drever as the new Vice Presidential nominee of the Geochemical Society. Roberta Rudnick seconded the motion. Those in favor were 10, those opposed 0, 0 absentia. The motion was accepted.

Scott Wood made a motion to select Jeremy Fein as the new nominee for Secretary of the Geochemical Society. Becky Lange seconded the motion. Those in favor were 9, those opposed 1, 0 absentia. The motion was accepted.

Becky Lange made a motion to select Eric Oelkers and Erwin Suess as the new Non-Officer Director nominees of the Geochemical Society beginning January 1, 2002. Roberta Rudnick seconded the motion. Those in favor were 10, those opposed 0, and 0 absentia. The motion was unanimously approved.

**Secretary's Report:** In Dave Wesolowski's absence, President Hochella reported that there was no action needed and briefly discussed the GS Board's actions taken since the last annual meeting, which are listed below:

- 1) Approved a motion to enter into a memorandum of understanding with IGNS and the Society of Economic Geologists whereby we pledge a maximum of \$12,500 US dollars toward the publication of Special Volume #8 in honor of Werner Giggenbach. SEG will publish the volume and will cover any costs in excess of the \$12,500 commitment from GS, IGNS and SEG.
- 2) Approved a joint GS/MSA short course entitled "Applications of Synchrotron Radiation in Low Temperature Geochemistry and Environmental Science" to be hosted by Paul Fenter, Mark Rivers, Neil Sturchio and Steve Sutton. The short course will be held in conjunction with the 2002 GSA annual meeting, and an RIM&G volume will be published jointly by GS and MSA.
- 3) Approved OGD's nomination of Dr. John Smith for the 2001 Treibs Medal.
- 4) Approved nominations of Dr. Ikuo Kushiro for the 2001 Goldschmidt Medal, Francois Morel for the 2001 Patterson Medal, and Craig Lundstrom for the 2001 Clarke Medal.
- 5) Approved the following persons to be named Geochemistry Fellows at the 2001 Goldschmidt Conference: Alex Halliday, Chris Hawkesworth, Bill Jenkins, Bo Joergensen, Igor Tolstikhin, and Rolland Wollast.

President Hochella made the following motion: "I move that we add to the minutes a commendation to Dave Wesolowski for his truly outstanding service to the Society for six years. His superb administrative skills have helped keep the Society on track over the time of three presidents, which has been invaluable." This motion was seconded by Mike Drake and the Board unanimously agreed to add this motion to the minutes.

**International Secretary's Report:** Eiichi Takahashi, International Secretary of the Geochemical Society, has been corresponding with Ross Taylor (former international secretary of the GS) and Y. Matsuhisa, President of the Geochemical Society

of Japan, with regard to exposure of the Geochemical Society in Japan. Takahashi reports the 2003 Goldschmidt Conference will be held in Kurashiki, Japan, September 7 – 12, 2003. The emphasis will be on some areas where Japanese Earth scientists have strength (e.g., high pressure experiments, igneous petrogenesis, arc magmatism, volcanic gasses, mineral physics, etc.). Takahashi also indicated that Matsuhisa contacted many others so that the meeting scope would be adequately expanded.

In order to increase the visibility of the activity of the Geochemical Society in Japan and also to increase the number of young scientists related to geochemistry, Takahashi has been planning a Short Course on isotope geochemistry in October sponsored by the GS. The timing and speakers were determined to correspond with the annual meeting of the Geochemical Society of Japan (October 18-20, Gakushuin University, Prof. H. Nagasawa is the local organizing Committee Chair.) At the Gakushuin meeting, Prof. Nagasawa already invited Profs. R. K. O'Nions and R. N. Clayton as the guest speakers. Takahashi sent an invitation to hold a short course before the Gakushuin meeting and they very kindly agreed to do so. If successful, Takahashi offered to organize another short course next year. Takahashi stated that expected attendance for the 2003 Goldschmidt Conference in Japan is approximately 800; 400 Japanese and 400 USA/Europeans. Davis reported that there are currently approximately 80 Japanese GS members.

**Treasurer's Report:** Becky Lange was happy to report that the GS investments represent a balanced portfolio that is being overseen by Tom Anderson, a Vice President at Salomon Smith Barney. A full financial report is expected from Lange in early July and Hochella recommends the BoD look at this report closely regarding cash flow.

We have two insurance policies (previously set up by former treasurer Don Elton and both with Travelers). The first policy deals with Publications and Review Volumes. The cost of this policy is approximately \$1900 a year. The second policy is a Professional Business Policy and costs approximately \$4,000 a year. Lange found a policy with Hartford Insurance Company that is comparable in coverage to this except that the cost is only \$739 a year. Mike Engel questioned whether coverage is included if overseas. Lange will check and report back. The overall conclusion was that the policy is nearly the same as the current policy and will be less expensive to the GS. A decision to change policies is pending and the Board will wait on Lange to report back.

**GS Business Report:** Seth Davis reported that the relatively low membership numbers may be due to the fact that there are so many societies. Engel said there have been many challenges trying to get membership up in all other societies and the goal should be to try and encourage cross-over memberships. Trower suggested to Davis to e-mail the corresponding author of all GCA accepted papers and try and recruit them to become a member of the Society. Davis offered to wait until the article actually came out in print, but the Board thought that it would be more timely to inquire once the paper has been actually accepted. Davis reported that of the 900 attendees at the Goldschmidt meeting this year, only 249 were registered members of the GS. McKenzie suggested automatic membership when registering for

the next Goldschmidt Conference. However, Drake said we cannot have mandates and that one size does not fit all. Bob Bodnar suggested we communicate with the MSA first, and all agreed.

Davis reported that Special Publication sales are high. Also, *The Geochemical News* is now available on the GS website. Rudnick suggested larger fonts on the website and Davis agreed to try changing them. Hochella inquired about the lifetime of the GS server and Podosek stated that it is becoming outdated and that more disk space could be used. Hochella reported that the GS website function and appearance are very good and that it has proven to be affordable.

Action items discussed were:

1) Secure On-Line Applications - The general consensus was that they are logistically difficult to maintain. Drake said to ask Becky Simmons to ask Kin Leung (LPI) how it's done at LPI. All agreed that a second opinion was needed.

2) Targeted Advertising – Engel is opposed to targeted advertising. Lange said to keep it simple, user-friendly with e-mail or *The Geochemical News*.

The Board then discussed veteran membership and whether a reduced rate should be offered. 12% of current members have been members more than 30 years. The Board unanimously agreed to offer a reduced rate (which will be the student rate) to any retired present member who is 65 years or older. Hochella granted permission to Davis to begin that policy immediately. Lifetime membership was discussed but is still pending and was tabled. Membership Grants will be issued in isolated cases with approval of the Board and the fee will be \$5.00 (student rate). The possibility of joint memberships was discussed and the Board decided to wait and see how it worked at the 2002 GS Conference in Switzerland next year. Hochella asked McKenzie for her inputs after next year's Goldschmidt Conference. McKenzie suggested Sponsor Options for the Geochemical Society. President Hochella recommended an announcement for a Sponsoring Individual in *The Geochemical News*. Lange said that we could reach more people by wording it "department" or "lab" rather than individual. A final decision on the wording was not determined.

The Board then discussed the cash value of the honoraria associated with the various GS medals. Some feel the Goldschmidt Honorarium should be a greater value than the Patterson, Clarke and Treibs. Hochella's preference is to make the Goldschmidt \$1,000 and all others \$500. The alternative would be to consider the Clarke as entry level around \$500, others at main level around \$1000, and the Goldschmidt at \$1500. Lange countered that the Treibs should be the same level as the Goldschmidt. Hochella stated the GS monetary awards would remain the same as they were voted on last year.

**Goldschmidt 2001 Report (Bob Bodnar):** The 2001 Goldschmidt Conference held here in Hot Springs, VA, was approved in Toulouse, France. This conference will include 720 talks and 164 posters. This is the largest North American meeting by 50%. As MSA representative to Goldschmidt, he was happy to report that MSA donated \$10K to help students come to the meeting. Bodnar welcomed all to Virginia and offered any assistance to any of us during our stay.

Continued on page 12

## Continued from page 11

**Future Goldschmidt Conferences:** Alex Halliday was unable to attend but submitted a report and his report was presented by Judith McKenzie. McKenzie stated the 2002 Goldschmidt Conference will be held August 18-23 in Davos, Switzerland. The plan of the 2002 GS Conference is to further engage communities with sessions that will provide an interesting forum of ideas within a broad geochemistry context. Many of the special sessions will aim to focus attention on new synergies between traditionally distinct disciplines. The conference will include a wide range of special sessions with the help of a new International Program Committee (IPC). The IPC is divided into Task Groups, each of which is chaired by two people. The convenors are Alex Halliday (ETH), Jan Kramers (Bern) and Rainer Wieler (ETH). The Goldschmidt Conference Organizing Committee is all Swiss-based and is comprised of Chris Ballentine, Stefano Bernasconi, Mike Cosca, Christian de Capitani, Mike Dungan, Jost Eikenberg, Albert Eschenmoser, Martin Engi, Karl Föllmi, Martin Frank, Detlef Günther, Christoph Heinrich, Jean Hernandez, Rolf Kipfer, Urs Krähenbühl, Bernhard Lehmann, Othmar Müntener, Thomas Nägler, Peter Nievergelt, Thomas Peter, Don Porcelli, Mark Rehkämper, Urs Schaltegger, André Scheidegger, Christian Schlüchter, Diane Seward, Jorge Spangenberg, Claudine Stirling, Thomas Stocker, Alan Thompson, Peter Ulmer, Crisogono Vasconcelos, Igor Villa, Friedhelm von Blanckenburg, Bernard Wehrli and Helmi Weissert. This committee has been divided into three groups:

- 1) The Program Committee, which is the largest (20) chaired by Halliday
  - 2) The Fund-raising and Communications Committee chaired by Wieler
  - 3) The Field Trips and Excursions Committee chaired by Kramers.
- In addition, two international committees have been established to assist with long term planning of all Goldschmidt Conferences.

Two international committees (the Goldschmidt Conference Advisory Board (GCAB) and the International Program Committee (IPC)) have been established to assist with long term planning of all Goldschmidt Conferences. The GCAB comprises the Vice-President, President and Past President of each sponsoring society plus the convenors of the past two conferences. The first announcements are out, the organization of the next GS conference is in full swing and the community is very helpful. Yukihiro Matsuhisa (President of the Geochemical Society of Japan) reported that the organizers of the 13th V. M. Goldschmidt Conference which will be held in Kurashiki, Japan, September 7-12, 2003, are trying to provide some continuity and he has made efforts to gather people and form committees. There is consideration of having two convenors for each symposium. Hochella suggested he communicate with Alex Halliday to take advantage of his structure and also recommended using Cambridge Publications and Paul Beatty. Hochella announced there is \$10,000 US available for students to attend the conference. Matsuhisa reminded the Board that transportation from the lodging to where the meeting will be held is a ten minute train ride.

The 2004 Goldschmidt Conference will be held in Copenhagen, Denmark and Susan Stipp is the organizer.

Mike Drake asked if anyone has given any thought to where the 2005 Goldschmidt Conference will be held. The Board discussed different sites and agreed to consider different places at this time. Drake offered to host it at the University of Arizona, if needed. The site for the 2005 Goldschmidt Conference is still pending and it was decided to insert an invitation for proposals for the site in *The Geochemical News*.

**GCA Executive Editor's Report:** Friso Veenstra announced that GCA on-line should be available (through Contents Direct) by the end of 2001. Frank Podosek reported that GCA is in good shape, support is high, and he is impressed with the level of volunteers that help contribute to the success of the journal. The overall rate of submission is growing slightly. When the editorial office started in October of 1999, hardcopy (paper) submissions outnumbered electronic submissions approximately 2 to 1. This proportion has now been reversed and the hope is that this proportion continues in this direction. We have received manuscripts from about 40 countries; the US accounts for about 40%. France, Germany, and the UK account for approximately 7% each. Several other countries (Australia, Canada, China, Japan, Switzerland) are each the source of a few percent. On average, about two-thirds of submitted manuscripts are accepted, many of them after significant revisions. It's not uncommon that rejected manuscripts are later resubmitted, often with much more favorable evaluations. The processing time from submission to the first evaluation report back to the authors (the "AE Report") is about three months. Podosek estimates that submission to publication time will level out at about 15 months, which represents about three months in review, five months in production, and seven months in revision. Lange suggested asking authors to return a revised version more quickly, and Podosek agreed to make the change in his letter to authors when asking for a revised version. The workload in the editorial office has become progressively less manageable so Podosek requested an increase in the budget from Elsevier to cover a staff of 2.5 (staff was 2 previously), and Elsevier agreed to do so. Robert Buchwaldt, a graduate student in the EPSC department at Washington University, has agreed to work as a "GCA Intern" half-time in the GCA editorial office. Karen Pollard resigned in March of 2001 to accept another position. However, Karen is still employed half-time and has helped train new employee, Cayce French, who started May 1.

Last year the Board considered moving the responsibility of production of the journal to the Society rather than using Elsevier in New York. Podosek stated that he is happy this was not done and he's very pleased with his interactions with the Elsevier agents, namely Friso Veenstra (and his predecessor, Peter Henn), John Eagleson, and especially Production Manager John Fotia. Podosek has received positive feedback from many colleagues that are impressed with the date their journals are now received, i.e. the date on the cover of the journal. This is a welcome development for which the editorial office can take no credit, but Podosek feels that a word of commendation to the production staff is appropriate before everyone takes it for granted. The average production time (the interval between when the editorial office transmits a manuscript to Elsevier and when it appears in print) is about 5 months. Podosek plans on discussing with John Eagleson and Elsevier the possibility of reducing this timeframe

to 4 months. Special Issues are devoted to some particular science theme, or an honoree on the occasion of retirement, significant birthday, etc. GCA is currently handling four Special Issues; Hal Helgeson (a double-issue which is expected to be printed November 2001), Heinrich Holland, Hatton Yoder and Robert Clayton. Podosek stated "For the record, significant policy issues regarding special issues are that (except for introductory editorials) manuscripts submitted to a special issue will be evaluated by normal standards for scientific quality and that they will be handled by the regular Editor and AEs (i.e. no guest editors or AEs). The Board discussed the possibility of abstracts in GCA and it was decided that Podosek will communicate with Friso Veenstra to obtain more information and report back to the Board.

**Special Publications Report:** Scott Wood reported that there are two Special Publications approved; the Giggenschbach Volume and the Crerar Volume.

1) Giggenschbach Volume: A MOU between GS, SEG and GNS (New Zealand) has been signed regarding joint publication of the volume. Stuart Simmons (University of Auckland) and Ian Graham (GNS) have been appointed as volume editors. An advisory board consisting of the volume editors, three SEG representatives (Raymond Coveney, Hu Barnes, and Jeff Hedenquist) and three GS representatives (Scott Wood, Dave Cole, and Greg Arhart) has been established. A deadline of October 2001 has been set for the submission of manuscripts. Wood said the \$12,500 GS commitment will be due by the time they start producing the volume and the bill will be due soon.

2) Crerar Volume: All manuscripts have been reviewed, revised and accepted. Negotiations with the University of Idaho Press are underway to obtain a quote for converting the electronic files into PageMaker and printing the volume. Publication is expected in the Fall of 2001.

#### **Reviews in Mineralogy and Geochemistry:**

1) The short course and RiMG volume "Molecular Modeling Theory and Applications in the Geosciences" (Cygan and Kubicki) are proceeding as planned. The short course will be given just prior to the Goldschmidt Conference in Hot Springs, VA and the volume will be available at the Conference.

2) The short course and RiMG volume "Applications of Synchrotron Radiation in Low-Temperature Geochemistry and Environmental Science" (Fenter, Rivers, Sturchio and Sutton) were approved by the BoD via e-mail vote in Autumn 2000. The short course is scheduled to be given just prior to the 2002 GSA meeting in Denver.

3) The RiMG volume "Noble Gases in Cosmochemistry and Geochemistry" (Porcelli, Ballentine, and Wieler) was approved at the Oxford BoD meeting. There will be no short course associated with this volume, but the editors have agreed to sponsor a related Special Symposium at a Goldschmidt or GSA meeting near the time of publication of the volume, which is expected sometime in 2002.

4) Informal proposals for new RiMG volumes. There have been two inquiries about possible new RiMG volumes. The first was by Pat Maurice regarding a volume on humic substances. The second was by Andreas Luttmann and Ken Nealson, regarding a proposed volume on Geomicrobiology, which would complement RiM v. 35. Everyone inquiring about new volumes is being told

that we will not be accepting any new volumes for publication before 2003, as we will have two volumes coming out in 2002. Wood hopes to convince MSA to sell our Special Publications and agreed to continue to serve as Special Publications Editor.

**Geochemical News Report:** In Neil Sturchio's absence, the GS Newsletter report was given by Mike Hochella. Hochella said as of January 2001 *The Geochemical News* (GN) was issued to all EAG members as well as GS members. Even with this, the cost of producing the newsletter has actually slightly decreased due to a change of the paper grade. The GN is currently being delivered to 750 EAG members and the BoD discussed the possibility of it being delivered to Japan. Hochella mentioned that Sturchio is paid a very small honorarium for putting together the newsletter and he commended Sturchio for his dedication and efforts.

**Geochemical Society Topics of Discussion:** The Board discussed the possibility of adding a new Society division in biogeochemistry, or changing the name of the OGD to reflect current and revolutionary advances in the understanding of biogeochemical systems on Earth. This idea was favorably received and it will be discussed among the OGD Division. They will report back to the Board as soon as possible.

The Ad-Hoc Medal Committee consists of Judith McKenzie, Peggy Ostrom, Vala Ragnarsdottir and Dave Wesolowski. The GS consists of 1,500 members and 4 medals are awarded each year. Relative to AGU and GSA, this is a relatively high medal/membership ratio. Nevertheless, the Board discussed adding a Distinguished Service Award and the idea was relatively well received. The proposal was discussed and tabled for now. Hochella asked McKenzie to communicate with the committee and report back with a title and definition for the award.

Mike Drake commended Mike Hochella for a fantastic job as President of the Geochemical Society during his term and all BoD members agreed.

Becky Lange motioned for the meeting to be adjourned. Mike Engel seconded the motion. The meeting was adjourned at 4:40 p.m.

These minutes were prepared by Linda Trower, Editorial Manager of *Geochimica et Cosmochimica Acta*, and submitted May 29, 2001.

visit the Geochemical Society web site!  
<http://gs.wustl.edu>

## The Mineralogical Association of Canada

Announces the publication of its

### Short-Course Volume 29:

## Laser Ablation-ICPMS in the Earth Sciences - Principles and Applications

Laser ablation-ICPMS is arguably the most exciting new analytical development in geochemistry in the last decade, opening up approaches to pure and applied geologic problems that were only dreamed of before. This short-course volume presents how laser-ablation-ICPMS works, what is being done with the method now, and what could be done in the future. It will appeal to all those scientists who are interested in solving problems with chemical data. Material is presented at the level of understanding of most graduate students in science. Technical topics discussed include: Nd-YAG and excimer laser instrumentation; laser beam delivery systems; ablation cell design; quadrupole, magnetic sector and time-of-flight ICPMS instrumentation; collision cell technologies; sample preparation; data acquisition, calibration and quantification strategies; laser ablation phenomena and element fractionation. This volume was prepared for a short course sponsored by the Mineralogical Association of Canada and held immediately preceding the joint annual meeting of the Geological Association of Canada – Mineralogical Association of Canada in St John's, Newfoundland. Over 70 participants from many different fields gathered from all over.

### Contributors

**Detlef Günther**, ETH Zürich, Switzerland

**Simon Jackson**, Lecturer, School of Earth Sciences, Macquarie University, Australia

**Jan Kosler**, Department of Geochemistry, Charles University, Czech Republic

**Henry Longenrich**, Department of Earth Science, Memorial University of Newfoundland

**Nuno Machado**, Sciences de la Terre, Université du Québec à Montréal

**Paul Mason**, Faculty of Earth Sciences, University of Utrecht, The Netherlands

**Marc Norman**, School of Earth Sciences, University of Tasmania, Australia

**Paul Sylvester**, Department of Earth Sciences, Memorial University of Newfoundland

**Geoff Veinott**, Department of Fisheries and Oceans, Northwest Atlantic Fisheries Centre

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### 223rd Annual Meeting of the American Chemical Society

Orlando Florida, April 7-11, 2002

Geochemistry Division of the American Chemical Society

(<http://membership.acs.org/G/GEOC/default.htm>)

### Complexity at the Water-Solid Interface: Mineral Surfaces and Nanoparticles

**Co-Organizers:** Ariel Chialvo ([chialvoaa@ornl.gov](mailto:chialvoaa@ornl.gov)), Paul Fenter ([fenter@anl.gov](mailto:fenter@anl.gov)),  
James Kubicki ([kubicki@geosc.psu.edu](mailto:kubicki@geosc.psu.edu)), and Mike Machesky ([machesky@sws.uiuc.edu](mailto:machesky@sws.uiuc.edu))

**Description:** Contributions (oral and poster) are invited concerning fundamental aspects of the interface of aqueous solutions with minerals, colloids, nanoparticles and other solids. Experimental (i.e. structure, speciation and sorption), as well as theoretical and modeling (including classical and ab initio) approaches are all encouraged, especially those studies that integrate or reconcile results over angstrom to micron length scales. Studies that deal with the unique properties and behavior of nanoparticles in natural environments are also welcome. Please contact any of the organizers for additional information.

**32nd International Geological Congress  
Florence, Italy, August 20-28, 2004**

**In collaboration with and under the sponsorship of the IUGS**

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**From the Mediterranean toward a Global Renaissance**  
Geology, Natural Hazards and Cultural Heritage

The 32nd International Geologic Congress will be held in Florence, internationally known as city of artistic heritage and cultural traditions. The recently remodeled pentagonal fortress of the Fortezza Da Basso, a wide area in the heart of the town, will host the event. The congress centre has a variety of modern integrated spaces which enable to display a large number of posters nearby the session rooms, to organise short courses, meeting of Scientific Associations, a Geoexpo exhibition, etc.

The 32nd IGC is being organized in cooperation with a number of perimediterranean countries grouped in the GEOMED Consortium. Italy and the Mediterranean area offer a great variety of choice for outstanding field trips on the most diverse geological subjects, from well studied mountain chains (Alps and Apennines) to the active volcanic areas surrounding Naples, the Etna Volcano in Sicily or the Aeolian Islands in the Tyrrhenian Sea, but also offer the possibility to focus on recent devastating natural hazards and on geological aspects of famous archeological sites such as Pompei and Paestum.

**CALL FOR SYMPOSIA, WORKSHOPS AND SHORT COURSES**

The rationale under which the 32nd International Geological Congress in Florence was approved in Rio, in August 2000, was centered on the need of the international geological community of fostering new ideas and models for implementing a close interplay between pure science and its applications.

The congress will include topics related to the whole spectrum of the Earth Sciences fields but also thematic sessions. A significant number of scientific sessions will be devoted to themes related to the Mediterranean area, natural hazards and cultural heritage but also to satisfy the aims of the IGC that meets only every four years. However, we invite to propose themes for symposia, workshops and short courses on all subjects. The themes accepted as appropriate for the meeting by the Scientific Program Committee, will be included in the **first circular** to be distributed by **early spring 2002**.

**GENERAL SYMPOSIA** - They will include issues related to the whole spectrum of the Earth science disciplines.

**SPECIAL SYMPOSIA** - They will focus on interdisciplinary issues and the latest scientific advancements. Poster sessions will be designed and organised to interact positively with the oral sessions.

**WORKSHOPS** - The selected workshops will be generally held before and after the Congress at the University of Florence (located nearby the Congress venue) or in other Italian Universities and Institutions.

**SHORT COURSES** - Pre- and post-congress short courses will be held at the University of Florence; during-congress short courses will be held at the Fortezza Da Basso Conference Venue.

Send your proposal forms before **September 30th 2001** to the following address:

Ms. Chiara Manetti  
Universita' degli Studi di Firenze  
Dipartimento di Scienze della Terra  
Via La Pira, 4 - 50121 FIRENZE - ITALY  
Tel/Fax: 055/2382146  
cmanetti@geo.unifi.it

Please note that acceptance of proposals will be acknowledged by early spring 2002. We are looking forward to hearing about new ideas that can contribute to the success of the Congress.

*Gian Gaspare Zuffa*  
(Chairman of the 32nd IGC Scientific Program Committee)  
<http://www.32igc.org/>

## Report on GERM 3, La Jolla, March 6-9, 2001

*G. Bebout, J. Blichert-Toft, R. Carlson, K. Cooper, M. Evans, K. Kelley, J. Konter, C. Reif, O. Rouxel, A. Shaw, G. Shields, H. Staudigel, and D. Stegman.*

The third Geochemical Earth Reference Model (GERM) workshop was held in La Jolla, California, on March 6-9, 2001. The GERM Initiative is supported by the National Science Foundation as a grass-roots effort working towards a better understanding of Earth as a global, chemical and dynamic system. GERM views the Earth as a planetary body in the solar system and includes all of the Earth's major geochemical reservoirs, from the core to the oceans and the atmosphere. GERM works to bridge the gaps between geochemical disciplines that often focus separately on the study of distinct reservoirs. GERM also emphasizes the relationships between geophysics and geochemistry, in particular for the study of deep Earth reservoirs that are not directly accessible to sampling. GERM organizes workshops, supports publications of state-of-the-art research on the Earth's dynamic system, provides technical help in establishing data bases, and provides technical tools for geochemical research. GERM maintains a website with information on the composition of earth reservoirs, partition coefficients, modelling tools, and a range of information on GERM and its workshop activities (<http://earthref.org/GERM/main.htm>).

GERM 3 was openly advertised for participation by any interested member of the Earth Science community. 69 participants registered, mostly from institutions in North America and Europe, including 10 graduate students. GERM 3 included three types of sessions, keynotes with extended discussion periods, poster presentations, and break-out sessions that were focussed on a series of more practical problems in geochemistry. Among the latter, GERM 3 discussed aspects of GERM approaches to geochemistry (arc systems and subcontinental mantle) and geochemistry infrastructure topics such as editorial guidelines for data publication and the need for establishing a geochemical sample repository accessible to all members of the community (read more about the geochemical sample repository initiative elsewhere in this issue). In this report we will provide brief summaries of keynote talks and break-out sessions. Other information about the meeting can be found on (<http://earthref.org/GERM/main.htm>).

GERM 3 was opened with welcoming remarks by SIO Director C. Kennel and IGPP Director J. Orcutt. Invited speakers to the opening session included Bill White, editor of *Geochemistry, Geophysics and Geosystems* (G-cubed), Al Hofmann, and John Helly. Bill White spoke on the development of G-cubed which is jointly published by the GS and the AGU. The scientific focus of G-cubed is on global geochemistry and geophysics, and it offers a range of conventional and new publication types. Conventional publication types include letters, articles and reviews and the more novel types of publications include data briefs, technical briefs, and characterizations. The latter three publication types have particular relevance for data bases, such as the GERM initiative. Data briefs allow for the publication of all data that are important contributions to science even though they may not necessarily

support any major new conclusions. Technical briefs are used to publish innovative chemical or computational techniques, and characterizations may be used to publish chemical or physical properties of large scale features on earth (the mantle, lithosphere etc.), without the necessity of major new interpretations. The copyright policy of G-cubed allows free access to all papers that have a relevance to databases (like GERM). Al Hofmann talked about some problems in geochemical data publications and suggested that much improvement is needed for scholarly data publications. Particular problems include 'bad habits' such as publication of data in diagrams only, or the poor documentation of analytical data or samples analyzed. He further suggested that conventional publication procedures appear unlikely to be able to keep up with the dramatically increasing volume of high-quality geochemical data. Electronic data publication and data bases will be increasingly needed to keep up with the increasing data flow, but it is essential to structure data bases such that they contain a scholarly documentation of data. John Helly expanded on the theme of controlled data publication and provided an Information Technology perspective on machinery and methods available today for the publication of data. These technologies are extremely diverse and adjustable to the needs of a particular application and discipline. The range of option includes system architectures where data are published in centralized, major data bases, a network of a large number of nodes that carry subsets of the available data, or peer-to-peer (NAPSTER) type data bases. Data review methods may include a strict peer review with editorial control to an author-controlled 'caveat-emptor' data publication. G-cubed as a peer-reviewed electronic journal was mentioned as an important step towards fully using information technologies in geochemical data publication. Helly also mentioned EarthRef.org, a data base system being developed at SIO and SDSC that explores a variety of data archiving and publication methods, ranging from the archiving of data supporting GERM to the publication of seamount bathymetry maps and geochemical modeling tools.

### Keynotes

Most of the conference focussed on a series of 45 minute keynotes followed by a typically quite vigorous 45 minute discussion period. Keynotes covered a wide range of topics from the Earth's core to the hydrosphere, from geochemistry and geophysics.

*Claude Allègre* on the silicate Earth and the core: Many existing models for determining the composition of bulk earth are overly complicated. Developing a more simplistic model that fits data and observations is therefore a worthwhile endeavor. Bulk earth can be determined based on carbonaceous chondrites where the different elements are distributed based on their different volatilities. It is assumed that bulk earth is a simple mass balance of its component reservoirs: continental crust, depleted mantle, primitive mantle, and core. Assuming further that continental crust and depleted mantle were derived from the primitive mantle, the equation for the bulk earth can be reduced to a sum of the primitive mantle and the core. Since certain refractory elements (Mg, Ca, Al, etc.) do not partition into the Earth's core, it can also be assumed that their bulk earth ratios are equivalent to their ratios in the primitive mantle. Because the primitive mantle is a mixture of

continental crust and depleted mantle, the partitioning behavior of different kinds of elements between these two reservoirs allows them to be proportionately mixed back together to compute the composition of the primitive mantle. The core, then, is calculated as a simple difference between the bulk earth and primitive mantle compositions.

*Marc Hirschmann* on the thermodynamics of mantle melting: The recent increase in available experimental data on a range of peridotite compositions allows for a more comprehensive evaluation of the role of chemical composition on the temperature of the solidus. The effect of compositional variations on the volatile-free peridotite solidus depends in large part on the competing effects between increased abundance of melt-enhancing components (alkalies, lower Mg#) and the increased compatibility of those components (clinopyroxene mode or CaO%). Based on theoretical, experimental, and field studies it seems plausible to infer that a veined peridotite/pyroxenite assemblage is a good candidate to represent the lithologies of the upper mantle. Studies of the thermodynamics of adiabatic decompression melting of veined mantle and the consequences for MORB petrogenesis and geochemistry were reviewed. Partial melting of pyroxenite during mantle upwelling can be particularly productive in the depth interval where pyroxenite is melting but peridotite is not. This results from a lower solidus for pyroxenite and melt enhancement by conductive heat flow from neighboring non-melting material. The proportion of melt derived from pyroxenite may therefore be greater than the abundance of pyroxenite in a mantle source region. Further investigations in progress (such as melt inclusion studies) should lead to a more comprehensive picture of the scale of mantle heterogeneities and the way they are produced and preserved in the convecting mantle.

*Bernie Wood* on element partitioning and Earth's core composition: Determining the composition of the Earth's Core is essential for understanding the internal structure, evolution, and present dynamics of the Earth. Studying how and to what degree elements are partitioned into either metal (siderophile elements) or silicate (lithophile elements) is key for understanding the processes in which the Earth differentiated and what the composition of the core might be. Several interesting observations have been made by examining the abundance of siderophile elements in the silicate portion of the Earth relative to a CI chondrite. First, very siderophile elements with a high temperature of condensation are not depleted enough in the silicate portion. Next, elements that are seen at low pressure to be only weakly siderophile are too depleted. Another interesting observation is that the core's density cannot be explained with a pure iron composition so there must be a sufficient amount (about 10 weight percent) of some light element or combination of light elements in the core that can account for the lower density. Therefore, any scenario of core formation needs to be able to explain both the abundances of siderophile elements in the silicate Earth as well as the presence of a light element in the core. There have been a number of efforts to estimate both the composition of the Earth as well as the composition of the core. One recent effort (Allègre, 2001, EPSL, 185, 49 or keynote above) hypothesizes that the major component of the light element of the core is silicon (roughly 7%). Therefore, the behaviour of silicon under various conditions has been studied to test this hypothesis. In general it is observed that high pressure

can dramatically change whether an element will partition into metal or silicate and to what degree it will partition. Experiments done at high pressure (25 GPa) and high temperatures (from 2500 to 2800 °C) show that silicon does become siderophile. By extrapolating just beyond the experimental data, the conditions required to dissolve roughly 7% silicon in the core can be estimated and suggest that a magma ocean much hotter than 3000 °C would be needed. In conclusion, it is possible to have silicon be the light element in the core, but due to large differences in the models used for extrapolation, it is difficult to say how plausible. It seems that it is difficult to put as much as 7% silicon in the core, but certainly a few percent is likely. In any case, if silicon were the major component of the light elements, then as a refractory lithophile element, it would have to become more siderophile than all of the other refractory lithophile elements.

*Jérôme Gaillardet* on global chemical fluxes in rivers: This presentation covered potamochemistry from 1) river discharge into the oceans, with boron as a case study, to 2) silicate weathering and its influence on the carbon cycle. In addition, some implications were discussed for the composition of the continental crust. Based on chemical analyses of both major and minor rivers worldwide, it was outlined how river chemistry can be used to constrain the effects of carbonate versus silicate weathering on, for example, CO<sub>2</sub> consumption, while emphasizing that refined riverine budgets are an essential first step to understanding ocean chemistry.

*Billy Moore* on dynamics and fluxes of fresh water input into the oceans: Coastal aquifers have relatively high nutrient and carbon concentrations and therefore any significant flux of water from these aquifers to the ocean will strongly affect coastal water nutrient, trace metal, and carbon budgets. Groundwater inputs may be identified using chemical tracers, in this case short-lived Ra isotopes. If the system is in balance, the rate at which the tracer is lost by mixing offshore must equal the rate at which it is being added near the coast. If we can measure the terms in this mass balance, we can establish the groundwater flux. Along the South Carolina coast, this groundwater flux has been estimated at 500 m<sup>3</sup>/s, about half of the river input to the oceans. Based on these results, groundwater flux should be considered when constructing coastal ocean solute and nutrient budgets.

*Tim Elliott* on mass balances of subduction: A first order estimate of the global flux of sediment and altered ocean crust into and out of the mantle via subduction zones is essential to understanding large scale Earth processes. Constraining this flux of material requires reliable input (both sediments and altered oceanic crust) and output (fluid, volcanic front and back-arc) data (compositions and volumes). The Mariana arc system has been used as a case study to quantitatively estimate fluxes through the subduction zone for various incompatible elements. The results show that for the islands studied, the subducted continental input flux lost to the arc front varies from 10 to 40%. Furthermore, if the back-arc basin volcanics are included in the mass balance, between 80 and 90% of the highly incompatible elements are returned to the crust through the arc and back-arc related volcanism. This seems to suggest that very little of the highly incompatible elements actually make it down into the deep mantle and thus cannot account for the recycled component in OIBs.

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*Dan Schrag* on D/H constraints on mantle-ocean hydrogen fluxes: It has previously been noted that there is a trend of increasing Ca and decreasing Mg and  $^{18}\text{O}/^{16}\text{O}$  with depth in pore fluid from deep-sea sediment cores. This pattern has been interpreted as a signature of high-temperature alteration of basalt, where the Ca, Mg, and  $^{18}\text{O}/^{16}\text{O}$  profiles reflect diffusion upward through the pore fluid in the sediment column. More recently, it has also been noted that D/H decreases in sediment pore fluid with depth in virtually all sediment cores, regardless of other variables such as organic content, sedimentation rate, and chemistry of sediment. Several explanations for the data have been proposed. Alteration of oceanic crust and diffusive exchange with pore fluid, adsorption of interlayer water in clays, and the presence of paleo-seawater are all unsatisfactory explanations for the decrease in D/H in pore fluid. The data appear to be best explained by a flux of low-D/H water from the oceanic crust or upper mantle into the base of the sediment pile. The importance of this interpretation in terms of fluxes between GERM reservoirs is that if the deuterium depletion in pore fluid is due to flux of mantle water from the crust, then this process could represent an important exchange between ocean water and mantle water.

*Guy Masters* on what, if anything, tomography says about geochemistry: To interpret what mantle tomography can tell us about earth properties, we must first understand the strengths and weaknesses of the data used in the inversions. Then we can evaluate what aspects of the models are robust. Of recent interest is the possibility of a dense layer in the lower mantle and the current status of possible compositional jumps in the upper mantle and transition zone. The 1D and 3D inversions use a combination of body waves, surface waves, and normal modes to constrain the seismic velocity models. Using resolution analysis, it is possible to choose a combination of data that is sensitive to one parameter at one depth. The resulting density models are well constrained, and raising the density by just 1% in a few hundred kilometer thick layer near the base of the mantle would wreak havoc on the mode data. Thus, it is unlikely that a «stealth» layer exists, though the complicated trade-offs involved in modelling free oscillation frequencies means that we cannot rigorously preclude the existence of such a model. Mineral physics has now provided reliable equations of state for most of the possible constituents of the mantle. Recent work indicates that a pyrolitic composition can fit the seismic data without any change in composition at the 660 km or 410 km discontinuity though, again, trade-offs with temperature preclude us from saying the mantle is isochemical with absolute certainty. Tomography results show that  $V_c$  (bulk sound speed) and  $V_s$  (shear wave velocity) are anti-correlated in the lower mantle. Most mantle anomalies can be explained thermally, but this anti-correlation cannot be explained by thermal effects alone. Therefore, we are searching for a combination of partial melt and chemistry changes in parts of the lower mantle to explain the anti-correlation. A new high-pressure polymorph of perovskite which may appear in regions of elevated temperature in the lower mantle could be an explanation.

### Break-Out Sessions

Two break-out sessions focussed on scientific issues,

namely arcs and the subcontinental mantle, and two sessions on technical issues including the publication of geochemical data and geochemical data base activities.

*Subduction-zone*: It was agreed upon that the existing conceptual («straw man») model for fluxing of seafloor materials into the mantle is sufficiently accepted by the community to allow for a first-order attempt at convergent-margin chemical mass-balancing. Although each has its own embedded complexities (which we should explore), the major flux categories presently used on the GERM «Subduction Filter» pages remain appropriate. Those include in particular fluxes in forearcs, the subarc slab, mantle wedge, backarcs and the deeper mantle. All present at the break-out session agreed that the theme of the subduction flux section of GERM should be the quantitative mass-balance of materials across individual convergent margins, in a representative set of relatively well known chemical and physical endmembers (e.g., thermal structure, nature and thickness of incoming sediment section, accretionary vs. non-accretionary, island-arc vs. continental arc). Because of the obvious overlap in our goals with those of the MARGINS Subduction Factory initiative, we will include in our subset of systems (8 or 9 systems), and initially concentrate on, the Izu-Bonin-Marianas (IBM) and Central American (Centam) convergent margins. We will attempt to coordinate our efforts with MARGINS to the greatest extent possible, beginning with the establishment of links between our web pages. One extremely significant development greatly enhancing our pursuits is the recent production of chemical databases for arc volcanic rocks (including Carr's CENTAM database and arc volcanics in GEOROC/Mainz). In addition to the many minor but necessary web page «tweaks», we will on our web pages begin our system-specific efforts by first concentrating on the IBM and Centam arc-trench systems. This will initially involve the construction of individual web pages for each of these systems, with lists of web links selected to allow one to quickly/efficiently access background physical and chemical information for that system. Our goal here is not to simply produce attractive web pages, but to provide «lean and mean» ability to synthesize the broad diversity of observations regarding the geometry, mechanical state, thermal structure, and geochemistry of each setting. We will solicit papers on issues key to our understanding of chemical fluxing at convergent margins, beginning in a special session at the upcoming AGU meeting in San Francisco and potentially leading to themes published in G-cubed. Another category of papers we will seek will be those directly attempting to mass-balance material fluxes across individual convergent margins. We hope to exploit the interfacing possible between our web pages and G-cubed-published data and models, and we will attempt to fully exploit the extremely broad database capabilities of Earthref.org in our interfacing of chemical data with other diverse observations.

*Subcontinental lithospheric mantle (SCL)*: Discussions centered on 3 questions: 1) Since most SCL rocks have suffered incompatible element enrichment through metasomatism, is the SCL a significant reservoir of incompatible elements?, 2) What role does the SCL play in continental magmatism? Source? Impediment? Modifier of sublithospheric melts?, and 3) What factors contribute most to the long-term stability of the SCL and what can cause its destruction? Attention also was focussed on

the presence of pyroxene-dominated, as opposed to peridotitic lithologies in the SCL and how such materials could influence the melting behavior of the SCL and the composition of SCL melts. The GERM data base already contains a significant number of analyses of SCL xenoliths, but a large number of new analyses have become available in the last few years. These new analyses often include both abundances of the platinum group elements and Re-Os isotope systematics that can provide information on the initial melt depletion events experienced by the SCL as opposed to later metasomatic events that dominate the lithophile element budget of these materials. Improvements to the GERM information data base on the SCL were proposed to take the form of a review of current understanding of the geochemistry, mineralogy and melting behavior of the various lithologies found in the SCL to be submitted to G-cubed, accompanied by updating of the GERM data base on SCL xenolith analyses. An additional contribution would take the form of making available on the GERM web page programs to calculate pressure and temperature from mineral chemistry of SCL xenoliths; a data base of elastic parameters for minerals that would allow calculation of density and seismic velocity for mantle rocks; and programs to calculate geotherms given user input distributions of heat producing elements.

*Geochemical data publication:* The discussions covered several concerns in geochemical data publication activity, including the attribution of data to original references, editorial guidelines, methods of data archiving and the longevity of data archives, access to electronic data supplements, and the copyright policy issues. The increasing tendency to use geochemical data from data bases marginalizes the original producer of data. It was emphasized that it is essential to any scholarly data base that every query in a data base should have the option of recovering all contributing data references. However, it was considered impractical and counter-productive to cite all of the original references in a paper that used a data base query. Editorial guidelines in geochemical journals do not contain any specific guidelines for what comprises a scholarly documentation of geochemical data. Too many papers are published with poor analytical documentation and insufficient sample descriptions. Too many data are published only in figures or element ratios and remain effectively inaccessible to the research community. A plan was made to begin a dialogue on what comprises scholarly publishing in geochemistry and to hold a conference for editors in geochemistry to establish a new and consistent set of editorial guidelines in Geochemistry. Most participants supported publication of data in electronic supplements and the publishers present agreed to free access to these data supplements. In fact the publishers agreed to work with the community to give most free and unfettered access to all data published, including the use of scanned original data tables. Overall, this session ended with a very positive outlook on the future of geochemical data publication by society and commercial publishers.

The breakout session on databases began with presentations on the major recent developments for data bases in geochemistry, including in particular the PetDB Ridge petrological data base at Lamont, GeoRoc at Mainz/Germany, and EarthRef.org at Scripps. Even though there are important differences between

these data bases, all of them were viewed as very positive and important contributions to geochemistry, even though such data bases appear to be a constant 'work in progress'. Several issues were named as much needed developments, in particular the transfer of data bases into more robust data base applications (Oracle), versioning of the data bases, as well as open access to all data and the interoperability of data bases. In particular the desire was expressed to develop a common geochemical metadata standard that will allow open exchange of data between data bases and between databases and users.

GERM 3, like previous GERM meetings, demonstrated the need to blend scientific vision in geochemistry with its publication and database infrastructure needs. GERM 3 will publish a theme volume in G-cubed including scientific contributions, data base contributions, reviews, and technical papers. This volume is likely to be completed by summer 2002. GERM also set the date and venue for the next GERM meeting to be held in Lyon, 20-23 May, 2003, thus returning the meeting to where the initiative originally started with GERM 1 in 1996.

### **Geochemistry in the 21st Century: a new GERM initiative**

*Steven L. Goldstein, Lamont-Doherty Earth Observatory  
William Melson, U.S. National Museum*

At the March 2001 GERM3 (Geochemical Earth Reference Model) Meeting in La Jolla, CA, a new initiative was launched that could have a major impact on the way we do terrestrial petrology and geochemistry. Its concept is based on procedures long established for meteorites, lunar samples, and marine cores and dredges. It is also in limited use at a number of museums, especially the U.S. National Museum. We propose establishing a set of protocols for archiving and accessing of important geological and environmental samples to a far greater extent than currently in effect.

The objective is to allow for a more broad-based access by the research community to important terrestrial samples, as well as responsible preservation of record keepers of the past history of our planet. Moreover, we foresee that in the future such important samples collected with public monies become public domain after a period where the collectors have sole investigative priority.

How often do we say to ourselves, "I wish I had those samples?" Those of us who work on samples from both above and below the water line are keenly aware of the differences in

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sample availability. If we want to work on terrestrial samples, we might be lucky and find that they are housed in a museum or a university collection. More generally, we have to organize a field trip, and begin our investigation from scratch. Or we find someone who has the samples that we want to investigate and is willing to share them. Sometimes we find that the person who had the samples has retired, and they have been thrown away.

This situation stands in marked contrast to the availability of extraterrestrial and marine samples. For example, if we want to analyze marine samples, we request them from a repository, and in all likelihood we will be able to begin an investigation.

The marine and cosmochemistry communities have long realized the pragmatic and the scientific benefits of open sample distribution and accept that samples are effectively public domain. This policy has been an important factor in the development of our knowledge of the Earth and the cosmos.

- Studies of archived marine samples, for example, have had a fundamental influence on the development of the plate tectonics paradigm and on our understanding of the Earth system over a range of disciplines, from marine geology and geophysics, to global climate change, to mantle dynamics.
- The availability of meteorites and lunar samples to the general cosmochemical community has facilitated fundamental advances in the understanding of the early history and the composition of the solar system and the Earth, and interstellar processes.

There are important historical reasons why marine, meteorite, and lunar samples are accessible to the general research community. Their collection requires obvious large-scale public expenditure. For most of these samples, re-collection is not a viable alternative. The need for a similar approach to terrestrial samples has not been as clear, because they are usually collected by individual or small groups of investigators. Yet it is a peculiar paradox that samples from the submerged flanks of ocean islands dredged aboard ship are public domain, while those from above the water line of the same island and collected with public money, are not.

The GERM initiative recognizes several pragmatic reasons to develop a more rational approach toward archiving and distribution of terrestrial samples.

- In terrestrial studies there is a large and increasing public investment in sampling and analyses.
- Terrestrial petrological and geochemical investigations are often global in scope and target samples from the far reaches of the Earth.
- Many important sample localities are difficult to access for logistical or political reasons.
- There are well-known cases where entire classic outcrops are destroyed or covered up by natural or human forces, thus precluding any chance to obtain new samples.
- Often, unique and important samples are lost at the end of a career or a large project.
- There are still far too few samples characterized for their

petrology and a comprehensive suite of chemical and isotopic compositions.

- The new initiative comes during an exciting time in which new analytical developments are revolutionizing the field of geochemistry. Major advances in geochemistry often occur in tandem with new analytical developments, and classic samples or suites are often the first to be analyzed.

The practical need for a more public archival and distribution system is reflected in changing attitudes toward samples collected or studied with public funding. The absence of any general system of sample curation is a waste of national resources, and leads to inefficiencies in the development of our science. Implementation of efficient avenues for sample archival and distribution will invigorate the future development of terrestrial geochemistry. Funding agencies and reviewers are becoming increasingly receptive to the idea that samples should become a national heritage in to further scientific advances for investigators in multiple fields.

Many practical issues will have to be considered in order to implement this initiative efficiently and cost-effectively. Possible archival models range from enhancement of current museum and university collections, to establishment of additional repositories based on the marine model, to a decentralized system dependent on individual investigators. Common to any approach is a need to develop a central web-based information resource, and to build upon presently existing sample collections, such as those at the U.S. National Museum and the American Museum of Natural History. Criteria and procedures will have to be established to decide which samples should be archived. The implementation will require cooperation of funding agencies.

The GERM Group is convinced that the change envisioned would have a revolutionary impact on the way terrestrial Earth Science is conducted. It would invigorate our science and enhance the rate of our scientific progress. It would deliver our community from an essentially feudal approach to one that befits the conduct of science in the twenty-first century. The first stage of implementation will be to organize a Working Group to evaluate the practical issues and propose a plan. Like GERM itself, the initiative will be an international one. On behalf of the organizers, we strongly encourage both participation and constructive feedback from members of the community.

## **Goldschmidt 2002**

### **FROM STARS TO LIFE**

August 20-28  
Davos, Switzerland

<http://www.goldschmidt-conference.com/gold2002/>

## In Memoriam: John M. Edmond

John Marmion Edmond, geochemist and professor in the Department of Earth, Atmospheric and Planetary Sciences at the Massachusetts Institute of Technology died unexpectedly on April 6, 2001.

John will be widely remembered throughout the oceanographic and wider earth sciences communities for both his enthusiasm for life and for his scientific accomplishments. A unifying theme throughout John's varied research career was an understanding of geochemical fluxes on a global scale. These studies took him from the Antarctic ocean to the rivers of Siberia, from the headwaters of the Amazon to the ocean depths. The overarching goal was always to understand what is controlling ocean chemistry.

John grew up in Glasgow Scotland where his early education was provided by the Jesuits. After graduating from the University of Glasgow with a degree in chemistry, he went on to study oceanography at the Scripps Institution of Oceanography, at the University of California, San Diego. From there, John joined the faculty at MIT in 1970.

John's thesis work was on the carbonate system which he often described as 'an elegant chemical system that is the most important one in seawater.' Some of John's early work was also on the silica system.

As a professor, John began his courses with discussions of Sillen, which I remember as 'Why isn't the ocean a saline lake (chemically)?' and then proceeded to challenge and inspire his students to discover the answers along with him. John's lab group set about understanding and evaluating river fluxes, and the processes controlling what actually makes it from the rivers, through the estuaries, and to the ocean. With a group of undergraduates and graduate students (including Ed Boyle, Bob Collier and Bob Stallard), some of this early work at MIT was on the local Merrimack River, as well as others.

In the early 1970s, good trace element data for the oceanic water column was non-existent. Yet John and his students recognized that the trace element distributions could potentially provide new insights into the important chemical processes occurring within the oceans, beyond what could be learned from the major and nutrient elements. Not only the dissolved chemistry, but also the particle flux was important. John's group (Jim Bishop, Ed Boyle, Bob Collier, Darlene Ketten, Chris Measures) worked on determining the distribution and geochemical processes of previously undetermined elements in ocean water and particles, including an early study on foram reproduction. One Christmas this activity was marked by the group giving John a T-shirt with the periodic table printed on it, the already accomplished elements crossed off, the remainder still to go! The river work also continued with the Amazon, Nile, Yangtze and Orinoco Rivers among others (with Hu Min Wei and Bob Stallard). Ongoing projects also included samples from various closed basin lakes in



the African rift system, as well as Baikal and the Caspian Sea.

In the late 1970s John was part of the group that first discovered seafloor hydrothermal venting at the Galapagos Spreading Center. The high quality trace metal analyses and implications for global fluxes are there in the very first papers published on the Galapagos hot springs (with Lui Chan, Bob Collier, Andy Hudson, Sally Husted, Russ McDuff). The Galapagos work was closely followed by the discovery of black smokers on the East Pacific Rise and Guaymas Basin, followed by sites in the Western Pacific and Atlantic (with Terri

Bowers, Andy Campbell, Chris German, Martin Palmer, Karen Von Damm).

Accompanying the work on potential new source and sink terms exemplified by the river and hydrothermal systems, was the continuing developmental work in John's group (Erik Brown, Lui Chan, Debbie Colodner, Hedy Edmonds, Kelly Falkner, Dong Soo Lee, Art Spivack) to determine new element and isotopic systematics in these systems as well as in the oceanic water column and lakes to better understand the extant geochemical processes.

Most recently John had again returned to his earlier focus on rivers and the evaluation of their fluxes to the ocean as a function of time and climatic regime (with Youngsook Huh).

John surrounded himself with good students and post-docs whom he provided with many opportunities and whom he staunchly defended. John often mentioned this as one of the reasons for being at MIT and associated with the MIT-WHOI Joint Program.

John had a talent for coming up with pithy sayings that expressed his opinions succinctly. Those in the hydrothermal community well remember John's description of the 'yo-yo' voyages of the Research Vessel Atlantis II (Mid-Atlantic Ridge to the Juan de Fuca Ridge via the East Pacific Rise), as well as the 'stamp collecting' aspects of hydrothermal studies. John's honors included AGU's Macelwane Medal, AGU Fellow, Fellow of the Royal Society, and most recently the Harold Urey Medal of the European Association of Geochemistry and Geochemical Society.

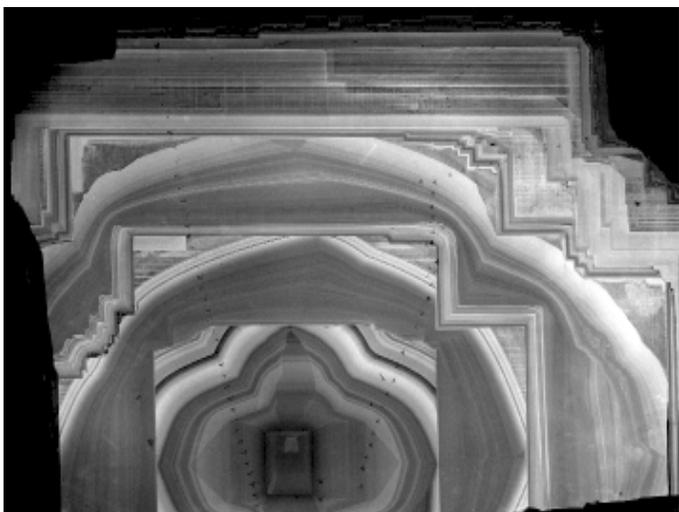
John's presence at meetings will be sorely missed. He often paced at the back of the room making comments - perhaps not always appreciated by the speaker at the time - but always insightful. John's insights into geochemical cycles and processes, most particularly in the oceans but also in the waters that feed them will remain important milestones in our understanding of geochemical fluxes. We have named a newly discovered hydrothermal field in the Indian Ocean as the Edmond field - another 'stamp collected' in his fond memory. A session is being planned in his honor at the December American Geophysical Union meeting in San Francisco.

*Karen Von Damm  
Ed Boyle*

## European Research Facilities: The Edinburgh Ion Microprobe Facility.

John Craven, Colin Graham, Ben Harte, Richard Hinton  
University of Edinburgh, King's Buildings  
Edinburgh EH9 3JW, Scotland, U.K.

<http://www.glg.ed.ac.uk/research/ionprobe/>



*Crystal growth zones as seen by cathodoluminescence in diamond. The zoning reflects variations in nitrogen abundance (varying from 2 to 1400 ppm). Diamond plate 3.3mm wide; ion microprobe analysis pits just visible.*

The Edinburgh Ion Microprobe Facility was established in 1987 as a centre for the application of Secondary Ion Mass Spectrometry (SIMS) to Earth and Environmental Science research in the UK. Present facilities at Edinburgh, using a Cameca ims 4f ion microprobe, support analysis of a wide range of trace elements (e.g. REE, LILE, HFSE), light elements (H, Li, Be, B, C, N), and stable isotope ratios (H, B, C, O, S). The initial funding came from the UK Natural Environment Research Council (NERC), which continues to support the Facility, but collaboration with scientists outside the UK is welcomed, and substantial projects have been conducted in collaboration with scientists from many European countries, USA, South Africa and Australia. Scientists are encouraged to make their own measurements in Edinburgh, and the Facility has provided training in the SIMS analytical technique for many visiting scientists (including post-graduate students).

In the SIMS technique a sample is bombarded with a focused beam of high-energy ions, the impact of which displaces atoms, molecules and ions from the sample surface. The charged particles (secondary ions) are accelerated away from the sample surface into a mass spectrometer where they are separated according to their energy and mass to provide an analysis of the sample surface. The overriding strength of the SIMS technique is that it provides rapid in-situ analysis for all the elements from H to U with a spatial resolution of <25µm and detection limits of often less than one part per million. In addition the only sample

requirements are that the material is flat and vacuum compatible; thus polished sections, slices and mounts, identical to those used for electron microprobe analysis or secondary electron imaging may be used. Another benefit is that there is minimal specimen damage (see heading photo). Since analysis can be performed on mounts of materials showing original textural and spatial relationships, it is ideal for zoned minerals, organic skeletons (e.g. corals) and other chemically heterogeneous material. The small beam size also means that the technique is readily used for analysis of fine-grained polyphase materials (e.g. experimental charges). As well as making point analyses on a polished surface, the technique can be used to measure element/isotopic variation with depth, enabling both diffusion gradients and changes in composition with depth to be determined.

The Edinburgh Facility is at the forefront of the application of SIMS to stable isotope determinations in geological materials. Over the next two years the Facility will expand with the acquisition of a new ion microprobe capable of high mass resolution, high transmission and multicollection. This will enable the age of minerals to be determined by measuring the U-Pb isotopes (a technique pioneered by the SHRIMP ion microprobe), and will provide higher precision (0.2‰) in stable isotope analysis. Associated micro-analytical equipment will also be upgraded with the installation of: a new electron microprobe (EPMA), allowing light element determination, and an up-grade to the Phillips XL30CP scanning electron microscope (SEM) with the installation of improved X-ray analysis (EDS) and Electron Backscatter Diffraction (EBSD) systems.

A very wide range of projects have been undertaken in Edinburgh in the last fourteen years, and the studies undertaken at the Facility are summarised in annual reports. A few examples of this diversity of projects are given below.

Micro-inclusions of solidified melt or crystals commonly occur within minerals and are frequently the focus of attention in endeavours to determine the earlier history of a mineral or the conditions of its formation. For example, diamonds have recently been found which contain distinctive inclusions showing a lower mantle parentage, rather than the more usual upper mantle associations. The inclusions are often less than 50 microns across, and the principal phases involved are: MgSiO<sub>3</sub> perovskite, CaSiO<sub>3</sub> perovskite, (Mg,Fe)O (ferropericlae), and a new aluminous phase<sup>3</sup> (codename TAPP). Trace element and oxygen isotope data have been obtained for such a suite of inclusions from São Luiz, Brazil (Harte et al., 1999). The trace element analyses (summarised in Figure 1) show that the REE are very strongly concentrated in the CaSiO<sub>3</sub> perovskite phase, and its stability and partition coefficients<sup>3</sup> with respect to melt must have had a profound effect on REE distribution in the early Earth. Using the REE compositions of the individual phases in the lower mantle diamonds, a bulk trace element composition corresponding to a pyrolite major element lower mantle composition may be calculated (Harte et al., 1999). Such a lower mantle bulk composition for the São Luiz material is clearly more enriched than estimated primitive mantle compositions (Figure 1), and possibly reflects an admixture of subducted material.

## Continued from page 25

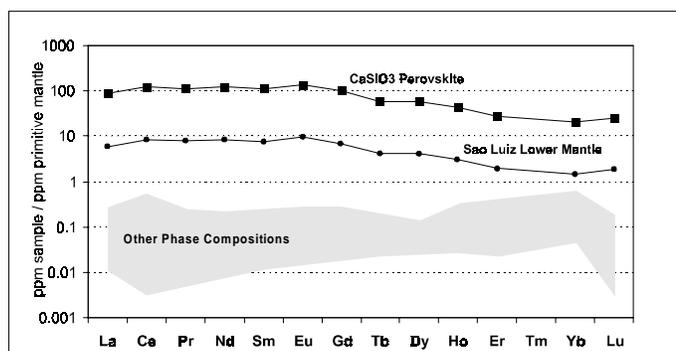


Figure 1. REE compositions for  $\text{CaSiO}_3$  perovskite and other phases ( $\text{MgSiO}_3$  perovskite, ferroperviclaste and TAPP) in inclusions in diamonds from São Luiz, Brazil. The bulk REE composition (São Luiz lower mantle), calculated to correspond with a pyrolite major element composition, shows enrichment above that expected for primitive mantle.

Quartz cements grow in the pore space of sandstones (Figure 2), reducing porosity and permeability. Predicting quartz cement distribution requires knowledge of the sources and pathways of fluids, the temperature distribution, and the origins of silica for cementation. The ion microprobe is capable of analysing  $\delta^{18}\text{O}$  and  $\delta^{30}\text{Si}$  in quartz in-situ with a spatial resolution of  $20\mu\text{m}$  and an analytical precision  $<1\%$ . This enables distinction between quartz overgrowths which have been sourced by biogenic silica from sponge spicules ( $\delta^{30}\text{Si}$  of  $-1$  to  $-2\%$ ) and the detrital silica ( $\delta^{30}\text{Si}$   $0\%$ ); whilst oxygen isotope analyses constrain quartz cement precipitation temperature and the composition of the pore fluid during quartz cementation.

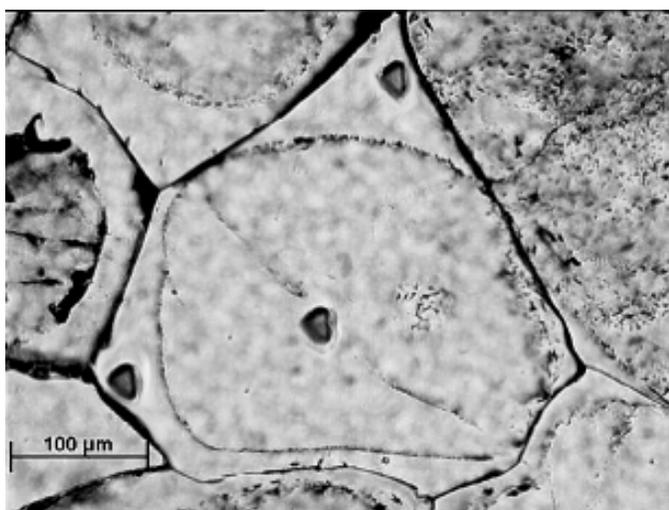


Figure 2. Detrital quartz grains of rounded shape showing overgrowths of silica cement in the Lochaline sandstone. Small rounded to triangular pits mark the positions of ion microprobe analyses.

Figure 3 summarises results obtained by Macaulay et al. (2001) for cemented horizons within the Cretaceous age Lochaline Sandstone (Scotland). The cement typically occurs as overgrowths on detrital quartz grains (Figure 2). The consistently high overgrowth  $\delta^{18}\text{O}$  values of  $30$  to  $35\%$  combined with independent fluid inclusion analyses, show that the quartz cements grew at temperatures below  $60^\circ\text{C}$  from a fluid with a mixed marine/meteoric composition. Such low temperature quartz precipitation is very unusual. The mean  $\delta^{30}\text{Si}$  of  $-2.2\%$  indicates a biogenic silica source, which is thought to be sponge spicules in overlying chalk formations.

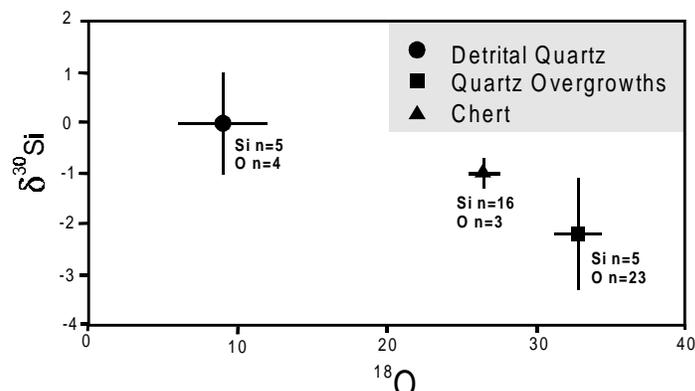


Figure 3. Oxygen and silicon isotope ratios in detrital quartz grains and cement from the Lochaline sandstone. The  $\delta^{30}\text{Si}$  for the cements and cherts suggest sponge spicules to be the source of silica.

Stable isotope ratios determined by ion microprobe have been widely used to identify fluid transport and exchange processes in the crust and mantle (e.g. Valley et al., 1998). Oxygen isotope gradients in mineral grains document fluid transport along grain boundaries in high temperature rocks. Modelling of these gradients has demonstrated short (10-104 yr) timescales of fluid flow, indicating episodically high permeabilities and fluid pressures (Graham et al., 1998). Similar approaches have been used to study carbon isotope variation and equilibration during diamond growth and residence in the mantle (e.g. Harte et al., 1999).

Measurements of H and C concentrations in phases like cordierite also provide a means of estimating fluid compositions during metamorphism and crustal melting (e.g. Carrington and Harley, 1996). Similarly, the capability of analysing hydrogen isotope ratios in hydrous minerals provides for the first time the possibility of assessing D/H variations at the intra-grain scale. The rapid diffusion of hydrogen even at low temperatures should result in hydrous minerals retaining information only about the last hydrous fluid exchange event in their histories. Thus in the case of mantle amphiboles in megacrysts and xenoliths, hydrogen isotope studies distinguish deep mantle from recycled hydrogen sources, and constrain rates of ascent and eruption. The very large gradients in D/H found in such amphiboles (Figure 5 and Valley et al., 1998) impose severe constraints on the time scale of mantle metasomatism and eruption.

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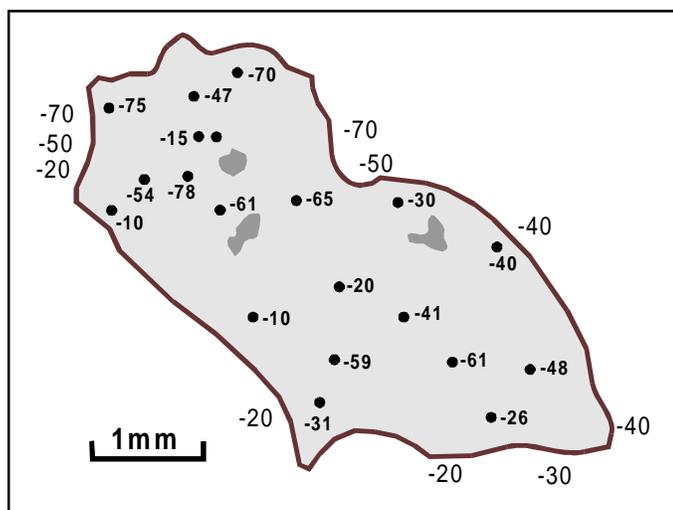


Figure 4. D/H variations in an amphibole crystal within a peridotite xenolith from Jagersfontein, South Africa.

Investigations of speleothems (stalactites and stalagmites) provide an example of the application of the ion microprobe to studies of the recent environment and climate change. Fairchild et al. (2000) have demonstrated that the banding seen visibly and in ultra-violet light within speleothems is accompanied by large changes in trace element composition. The high spatial resolution of the ion microprobe permits measurements on the speleothem zones which bring out seasonal as well as annual changes. In Figure 5 each vertical line represents a distinct dark lamina on the specimen and corresponds to the input of organic-rich water flushed during autumn rains. A distinct annual cyclicality is visible for P, H and Sr, whilst Mg shows less regularity of change with the season.

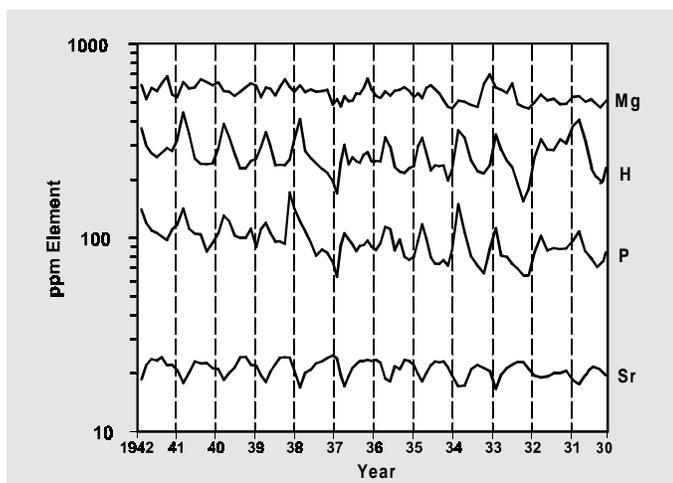


Figure 5. Seasonal pattern of trace element variation in the Ernesto stalagmite (Italy).

The above studies illustrate the variety of projects which may be undertaken with the ion microprobe, and shows its value as a micro-analytical tool for extracting information from rocks at the

grain scale and below, in order to bring out conditions and processes of formation in rocks and minerals.

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- Fairchild, I.J., Borsato, A., Tooth, A.F., McDermott, F., Frisia, S., Hawkesworth, C.J., Huang, Y. and Spiro, B. (2000) *Chemical Geology*, **166**, 255-269.
- Graham, C.M., Valley, J.W., Eiler, J.M. and Wada, H. (1998) *Contributions to Mineralogy and Petrology*, **132**, 371-389.
- Harte, B., Harris, J.W., Hutchison, M.T., Watt, G.R. and Wilding, M.C. (1999) *Geochim. Society Spec. Publ. No 6, Boyd volume*, 125-153.
- Harte, B., Fitzsimons, I.C.W., Harris, J.W. and Otter, M.L. (1999). *Mineralogical Magazine*, **63**, 829-856.
- Macaulay, C.I., Fallick, A.E., Marchand, A.M.E., Haszeldine, R.S. and Graham, C.M. (2001) *Geochimica et Cosmochimica Acta*, in review.
- Valley J.W., Graham C.M., Harte B., Eiler J.M., and Kinny P.D. (1998) In: *Applications of Microanalytical Techniques to Understanding Mineralizing Processes Reviews in Economic Geology*, Vol. 7, Chapter 4, 73-98.

### Sulfur Cycling in Precambrian to Recent Ocean-Atmosphere Systems: A Session Honoring the Career of William T. Holser

Topical Session T11 at the 2001 Meeting of the Geological Society of America, Boston, Mass., November 5-8

Sponsored by the Geochemical Society

Organizers: Timothy W. Lyons, University of Missouri, Columbia, Mo.; Alan J. Kaufman, University of Maryland, College Park, Md.

Sulfur isotopes record a complex interplay of environmental conditions in modern and ancient settings. This session will emphasize how recent studies of microbial pathways and new and refined analytical and modeling approaches have improved our ability to infer ancient environments using sulfur geochemistry.

Type of session: ORAL; Keywords: Geochemistry, Aqueous, Geomicrobiology, Precambrian Geology

Additional meeting details can be obtained at:  
<http://www.geosociety.org/meetings/2001/index.htm>

## Meetings Calendar

**Aug. 12-17, 2001: Gordon Conference on Chemical Oceanography**, Tilton School, Tilton, NH, USA. Web site: <http://www.grc.uri.edu/programs/2001/chmocean.htm>.

**Aug. 19-24, 2001: Gordon Research Conference "Formation, Modification and Preservation of Ore Deposits", focusing on geochemical aspects of tectonic, climatic and surficial processes.** Proctor Academy, Andover, New Hampshire, U.S.A. Co-chairs, John Thompson, Jean Cline and Jeff Hedenquist. Web site: <http://www.grc.uri.edu/programs/2001/inorggeo.htm>.

**Aug. 26-29, 2001: 6th Biennial SGA Meeting — Mineral Deposits at the Beginning of the 21st Century**, Krakow, Poland. Contact: 6th Biennial SGA Meeting, Dr. Wojciech Mayer, University of Mining and Metallurgy, Faculty of Geology, Geophysics & Environmental Protection, av. Mickiewicza 30, 30-059 Kraków, Poland; Phone: +48-12-6172385; Fax: +48-12-6332936, E-mail: [wmayer@geol.agh.edu.pl](mailto:wmayer@geol.agh.edu.pl). Web site: <http://galaxy.uci.agh.edu.pl/~sga/>

**Aug. 26 - 30, 2001: Geochemistry Division, American Chemical Society 222nd National Meeting**, Chicago, Illinois, U.S.A. Web site: <http://membership.acs.org/G/GEOC/>.

**Aug. 27-29, 2001: 6th Biennial Meeting of the Society for Geology applied to Mineral Deposits**, Krakau, Poland. Contact: Dr. W. Mayer, Faculty of Geology, Geophysics and Environmental Protection, av. Mickiewicza 30, 30-059 Krakow, Poland; Fax: +48-12-633-2936; E-mail: [wmayer@geol.agh.edu.pl](mailto:wmayer@geol.agh.edu.pl). Web site: <http://www.galaxy.uci.agh.edu.pl/sga>.

**Aug. 27-31, 2001: IAG International Symposium on Recent Crustal Movements**, Helsinki, Finland. Contact: SRCM, Finnish Geodetic Institute, P.O. Box 15, Masala, FIN-02430, Finland; Phone: +358 9 195 550; Fax: +358 9 295 55200; E-mail: [SRCM@fgi.fi](mailto:SRCM@fgi.fi). Web site: <http://www.fgi.fi/SRCM>.

**Aug. 29-Sept. 3, 2001: Submarine craters and Ejecta-Crater Correlation.** Workshop and excursion within the European Science Foundation Programme. With a special session on icy impacts and icy targets. University center UNIS, Svalbard, Norway. Web site: <http://www.geologi.uio.no/avdG/esf-svalbard2001>

**Aug. 31-Sept. 12, 2001: Field Excursion to the Skaergaard Intrusion**, Skaergaard area, Kangerdlugssuaq, East Greenland. IGCP Project 427, SGA. Contact: Dr. Jens C. Andersen, Camborne School of Mines, University of Exeter, Redruth, Cornwall, TR15 3SE, UK; Phone: +44 1209 714866; E-Mail: [andersen@csm.ex.ac.uk](mailto:andersen@csm.ex.ac.uk). Web site: <http://www.ex.ac.uk/CSM/news/confs.htm>

**Sept. 3-4, 2001: International Conference on Cathodoluminescence and related techniques in Geosciences and Geomaterials**, Freiberg, Germany. Organized by: Society for Luminescence Microscopy and Spectroscopy (SLMS), German Mineralogical Society. First circular can be ordered from: Jens Götze, Vice president of SLMS, Department of Mineralogy, Freiberg University of Mining and Technology, Brennhausgasse 14, 09596 Freiberg, Germany; E-mail: [goetze@mineral.tu-freiberg.de](mailto:goetze@mineral.tu-freiberg.de). Web site: <http://sonne.hrz.tu-freiberg.de/>.

**Sept. 3-5, 2001: 21st Meeting of the International Association of Sedimentologists**, Davos, Switzerland. There will be a special session entitled "Sedimentology of organic matter". Contact: Prof. Georges Gorin, Dpmt of Geology-Paleontology, Univ. of Geneva, 13 rue des Maraîchers, 1211 Geneva 4, Switzerland; Phone: + 41 22 702 66 07; Fax +41 22 320 57 32. Web site: <http://www.ias-2001.ethz.ch>.

**Sept. 3-7, 2001: 6th international conference on rare gas geochemistry (ICRGG-6)**, Cuernavaca, México. E-mail: [6icrgg@tonatiuh.igeofcu.unam.mx](mailto:6icrgg@tonatiuh.igeofcu.unam.mx); Fax: +52 5 550 24 86 (Indicate ICRGG-6). Web site: <http://www.igeofcu.unam.mx/conference/index.html>.

**Sept. 3-7, 2001: Écorad 2001 - International congress on the radioecology-ecotoxicology of continental and estuarine environments**, Palais des congrès, Aix-en-Provence, France. Contact: ECORAD 2001 - IPSN-DPRE - Bât. 02, Rue Auguste Lemaire B.P. n°6 / 92265, Fontenay-aux-Roses cedex, France; Phone: +33 1 46 54 79 06; Fax: +33 1 46 54 72 90; E-mail: [ecorad.2001@ipsn.fr](mailto:ecorad.2001@ipsn.fr). Web site: <http://www.ipsn-dpre.com/ecorad2001/>.

**Sept. 6-8, 2001: CL2001 - Cathodoluminescence in Geosciences. New insights from CL in combination with other techniques.** Freiberg, Germany. Organized by Freiberg University of Mining and Technology and Ruhr-University Bochum. Contact: CL 2001 Secretariat, Freiberg University of Mining and Technology, Department of Mineralogy, Brennhausgasse 14, 09596 Freiberg/Sachsen, Germany; Phone: +49 3731 392 628 or +49 3731 393 129; E-mail: [goetze@mineral.tu-freiberg.de](mailto:goetze@mineral.tu-freiberg.de). Web site: <http://www.mineral.tu-freiberg.de>.

**Sept. 10-14, 2001: 20th International Meeting on Organic Geochemistry (IMOG 2001)**, Nancy, France. Abstract deadline: December 1, 2000. Contact: E-mail: [imog2001@g2r.uhp-nancy.fr](mailto:imog2001@g2r.uhp-nancy.fr). Web site: <http://www.imog.uhp-nancy.fr>.

**Sept. 11-15, 2001: Biogeochemical Processes and Cycling of Elements in the Environment (ISEB 15)**, Wroclaw, Poland. 15th International Symposium on Environmental Biogeochemistry. Contact: ISEB 15 Organizing Committee, Agricultural University of Wroclaw, Institute of Soil Science and Agricultural Environment Protection, Grunwaldzka 53, 50-357 Wroclaw, Poland; E-mail: [iseb15@ozi.ar.wroc.pl](mailto:iseb15@ozi.ar.wroc.pl); Phone: +48 (71) 3205631, +48 (71) 3205632; Fax: +48 (71) 3205631. Web site: <http://www.ar.wroc.pl/~weber/iseb15.htm>.

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**Continued from page 25**

**Sept. 15-20, 2001: The Deep Earth: Theory, Experiment and Observation: Mantle Processes**, Espinho (near Porto), Portugal. Contact: J.A.M. Paulssen, Earth Sciences, University Utrecht, Budapestlaan 4, 3584 CD Utrecht, The Netherlands; Phone: +31 30 2535089; fax: +31 30 2533486; E-mail: paulssen@geo.uu.nl. Web site: <http://www.esf.org/euresco/01/lc01125a.htm>

**Sept. 16-19, 2001: Second Joint IAH-CNC and CGS Groundwater Specialty Conference**, Calgary, Alberta, Canada. Web site: <http://tabla.geo.ucalgary.ca/iah-cnc/>

**Sept. 17-21, 2001: 7th International Conference on Paleoceanography (ICP7)**, Sapporo, Japan. Abstract Deadline: March 10, 2001. Co-Conveners: Hisatake Okada (Dept. of Earth and Planetary Sciences, Graduate School of Science, Hokkaido University, Sapporo, 060-0810, Japan; Phone: +81-11-706-3537; Fax: +81-11-746-0394; E-mail: oka@cosmos.sci.hokudai.ac.jp), Itaru Koizumi, and Tadamichi Oba.

**Sept. 23-25, 2001: 18th Annual Meeting Society for Organic Petrology (TSOP)**, Westchase Hilton and Towers, Houston, TX, USA. Special session on Gulf of Mexico geochemistry by Houston Organic Geochemical Society (HOGS). Contact: Dr. Coleman Robison, Texaco E&P Technology Division, 3901 Briarpark Dr., Houston, TX 77042; Phone: +1 713 432 6828; E-Mail: robiscr@texaco.com. Web site: <http://www.tsop.org>.

**Sept. 30-Oct. 2, 2001: From Basins to Mountains: Rodinia at the Turn of the Century**, Perth, Australia. Contact: K. Sircombe, TSRC, Dept. of Geology and Geophysics, University of Western Australia, 35 Stirling Highway, Crawley, Perth, Western Australia WA 6009, Australia; Phone : +61 8 9380 7871; Fax: + 61 8 9380 7848; E-Mail: ksircombe@tsrc.uwa.edu.au. Web site: <http://www.tsrc.uwa.au/projects/440events/440events.html>

**Oct. 14-18, 2001: N2001 - The Second International Nitrogen Conference**, Bolger Conference Center, Potomac, Maryland, USA. Optimizing Nitrogen Management in Food and Energy Production and Environmental Protection. Web site: <http://esa.sdsc.edu/n2001/>

**Oct. 21-24, 2001: Third South American Symposium on Isotope Geology**, Gran Hotel Pucón, Pucón, Chile. Organized by the Servicio Nacional de Geología y Minería de Chile (SERNAGEOMIN), Dept. de Geología, Universidad de Chile, and Sociedad Geológica de Chile. Contact: Eugenia Fonseca, Laboratorio Sernageomin, Til-Til 1993 Ñuñoa, Santiago, Chile; Phone: + 56 2 2385292; E-Mail: ssagi@sernageomin.cl. Web site: <http://www.sernageomin.cl/ssagi/>

**Oct. 21-25, 2001: 8th Annual Meeting of the International Society for Reef Studies (joint meeting with ICCB)**, Eilat, Israel. Contact: congress secretariat at Dan Knassim Ltd., P.O.Box 1931, Ramat-Gan 52118, Israel; Phone: : +972-3-6133340 Ext. 209; Fax: +972-3-6133341; E-Mail: team4@congress.co.il.

**Nov. 5-8, 2001: Geological Society of America Annual Meeting**, Boston, MA USA. Contact: GSA Meetings, Box 9140, Boulder, CO 80301-9140, USA; Phone: +1 303 447-2020 or 1-800-472-1988; Fax: 303-447-0648; E-mail: meetings@geosociety.org. Web site: <http://www.geosociety.org/meetings/index.htm>.

**Nov. 7-9, 2001: 3rd Asia Symposium on Environmental Geochemistry**, Guangzhou, China. Contact: Dr. Ron T. Watkins, Secretary, SEG, Asia/Pacific Branch, Environmental Inorganic Geochemistry Group, Curtin University of Technology, GPO Box U1987, Perth 6845, Australia; E-mail: iwatkins@info.curtin.edu.au. Web site: <http://www.gigac.cn/apseg.htm>.

**Dec. 10-14, 2001: Fall Meeting of the American Geophysical Union**, San Francisco, California, USA. Web site: <http://www.agu.org>

**Jan. 21-25, 2002: Chapman Conference: Explosive Subaqueous Volcanism**, Dunedin, New Zealand. Abstract and travel deadlines: October 1, 2001. Contact: J.D.L. White, University of Otago, Dunedin, New Zealand (E-mail: james.white@stonebow.otago.ac.nz) and Bruce F. Houghton, University of Hawaii, Honolulu (E-mail: bhought@soest.hawaii.edu).

**Jan. 27-30, 2002: Tailings and Mine Waste '02**, Colorado State University, Fort Collins, Colorado, USA. Contact: Linda Hinshaw, Department of Civil Engineering, Colorado State University, Fort Collins, CO 80523-1372, USA; Phone: +1 970-491-6081; Fax: +1 970-491-3584/7727; Email: lhinshaw@enr.colostate.edu.

**Feb. 11-15, 2002: AGU Ocean Sciences Meeting**, Honolulu, Hawaii, USA. Web site: <http://www.agu.org>.

**March 11-13, 2002: Geo 2002: The 5th Middle East Geosciences Exhibition and Conference**, Bahrain. Contact: Overseas Exhibition Services Ltd., 11 Manchester Square, London W1M 5AB, UK; Phone:: +44 207 8622000; Fax: +44-202-862-2078; E-mail: pmckean@montnet.com.

**March 19-22, 2002: 19th Colloquium of African Geology, El Jadida, Morocco**. Organized by Chouaïb Doukkali University, Faculty of Sciences, El Jadida, Morocco and the Geological Society of Africa. Field trips start on March 23. Contact: Secretariat du 19ème CIGA, Université Chouaïb Doukkali, Faculté des Sciences, Département de Géologie, B.P.20, 24000, El Jadida, Maroc; Phone: + 212 23 34 23 25 / 23 34 30 03; Fax : +212 23 34 21 87; E-mail: cag19@ucd.ac.ma. Web site: <http://www.ucd.ac.ma/geologie/cag19.html>.

**April 7 - 11, 2002: Geochemistry Division, American Chemical Society 223rd National Meeting**, Orlando, Florida, USA. Symposia web site: <http://membership.acs.org/G/GEOC/>. Abstract submission at: <http://oasys.acs.org/>.

**May 8, 2002: 100th Anniversary of the eruption of Mt. Pelee**. International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) workshop, Martinique. Web site: <http://www.iavcei.org>.

**May 28-June 1, 2002: AGU Spring Meeting**, Washington, DC, USA. Web site: [www.agu.org](http://www.agu.org).

**April 24-26, 2002: 15th Argentine Geological Congress**, El Calafate, Santa Cruz Province, Southern Patagonia, Argentina. (Contact: President Dr. Miguel Haller, or Secretary Dr. Roberto Page, Asociacion Geologica Argentina, Maipu 645, 1 er Piso, Buenos Aires, Argentina; Phone: + 54 11 4325 3104; E-Mail: [haller@cenpat.edu.ar](mailto:haller@cenpat.edu.ar) or [fomicruz@internet.siscotel.com](mailto:fomicruz@internet.siscotel.com)).

**June 3 - 7, 2002: Zeolite 2002**, Aristotle University, Thessaloniki, Greece. Under the auspices of the International Committee on Natural Zeolites (ICNZ), by the Aristotle University of Thessaloniki and the Institute of Geology and Mineral Exploration (IGME). Contact: Prof. Panagiotis Misaelidis, Aristotle University, Department of Chemistry, P.O. Box 1547, GR-540 06 Thessaloniki, Greece; Phone: +30 31 997789; Fax: +30 31 997753; E-mail: [misailid@chem.auth.gr](mailto:misailid@chem.auth.gr). Web site: <http://www.chem.auth.gr/activities/zeo2002/>.

**July 21-25, 2002: 9th International Platinum Symposium**, Holiday Inn - Grand Montana, Billings, MT, USA. By the IGCP 427/SEG/SGA. Contact: Roger Cooper, Dept. of Geology, Lamar University, P.O. Box 10031, Beaumont, TX 77710, USA; Phone: +1 409-880-8239; E-Mail: [cooperrw@hal.lamar.edu](mailto:cooperrw@hal.lamar.edu). Web site: <http://www.platinumsymposium.org/>.

**July 22-26, 2002: 65th Annual Meeting of the Meteoritical Society**, UCLA DeNeve Plaza Conference Center, Los Angeles. Contact: Paul Warren, Institute of Geophysics, UCLA, Los Angeles, CA 90095-1567; E-mail: [pwarren@ucla.edu](mailto:pwarren@ucla.edu). <http://www.lpi.usra.edu/meetings/upcomingmeetings.html>

**July 22-26, 2002: The Earth System and Metallogensis - 11th Quadrennial IAGOD Symposium and GEOCONGRESS 2002**, Windhoek, Namibia. Main theme: Sedimentary and magmatic responses to compressional and extensional tectonics and the associated ore-forming processes. Hosted by: The Geological Society of Namibia, the Geological Society of South Africa, The Geological Society. Contact: IAGOD / Geocongress 2002 Conference Secretariat, P.O. Box 9870, Windhoek, Namibia; Phone: + 264 61 251014; Fax: + 264 61 272032; E-mail (Alice Kaukuetu-Hue): [geoconference2002@conferencelink.com.na](mailto:geoconference2002@conferencelink.com.na). Web site: [www.geoconference2002.com](http://www.geoconference2002.com).

**Aug. 18-23, 2002: Twelfth Annual V.M. Goldschmidt Conference, incorporating ICOG X**, Davos, Switzerland. Contact: Cambridge Publications, P.O. Box 27, Cambridge CB1 8TR, U.K; E-mail: [Gold2002@camppublic.co.uk](mailto:Gold2002@camppublic.co.uk). Web site: <http://www.goldschmidt-conference.com/gold2002/>.

**Sept. 2-7, 2002: Holocene environmental catastrophes and recovery**, Brunel University, West London, UK. Co-sponsored by Brunel University, INQUA and PAGES. Contact: Prof. Suzanne A. G. Leroy, Department of Geography and Earth Sciences, Brunel University, Uxbridge, Middlesex UB8 3PH, (West London), UK; Phone: +44-1895-20 31 78; Fax: +44-1895-20 32 17; Phone secr: +44-1895-20 3215; E-mail: [suzanne.leroy@brunel.ac.uk](mailto:suzanne.leroy@brunel.ac.uk). Web site: <http://www.brunel.ac.uk/depts/geo/Catastrophes/>.

**Sept. 9-13, 2002: Mineralogy for the new millenium (IMA 2002), 18th General Meeting of the International Mineralogical Association**, Edinburgh, United Kingdom. Contact: Mr K. Murphy, Executive Secretary, Mineralogical Society of Great Britain and Ireland, 41 Queen's Gate, London SW7 5HR, United Kingdom: Phone: +44 171 584 7516; E-mail: [IMA@minersoc.demon.co.uk](mailto:IMA@minersoc.demon.co.uk).

**Sept. 16-20, 2002: Uranium Mining and Hydrogeology III - International Mine Water Association. Symposium - Mine Water and The Environment**, Freiberg, Germany. Contact: Prof. Dr. B. Merkel, Dr. Christian Wolkersdorfer, Lehrstuhl für Hydrogeologie; Gustav-Zeuner-Str. 12; D-09596 Freiberg/Sachsen, Germany; Phone: +49 3731 39 3309; Fax: +49 3731 39 2720; E-mail: [UMH@IMWA.de](mailto:UMH@IMWA.de). Web site: <http://www.IMWA.de>.

**Oct. 24-26, 2002: Synchrotrons, Low Temperature Geochemistry, and Environmental Science**, Estes Park, Colorado. Geochemical Society and Mineralogical Society of America Short Course (details in the next issue of GN)

**Oct. 27-30, 2002: Geological Society of America Annual Meeting, Denver, Colorado, USA**. Contact: GSA Meetings, Box 9140, Boulder, Colo. 80301-9140. Tel: +1-303-447-2020, ext. 164; Fax: +1-303-447-1133. Web site: <http://www.geosociety.org/meetings/index.htm>

**Dec. 6-10, 2002: AGU Fall Meeting**, San Francisco, California, USA. Web site: [www.agu.org](http://www.agu.org).

**May 20-23, 2003: GERM 4**, Lyon, France. Contact: Janne Blichert-Toft, Laboratoire de Sciences de la Terre (CNRS UMR 5570), Ecole Normale Supérieure de Lyon, 46, Allée d'Italie, 69364 Lyon Cedex 7, France; Phone: + 33 (0)472 72 84 88; Fax: +1 33 (0)472 72 86 77; E-mail: [jblicher@ens-lyon.fr](mailto:jblicher@ens-lyon.fr).

**Sept. 7-11, 2003: 6th International Symposium on Environmental Geochemistry (ISEG)**, Edinburgh, UK. Contact: Dr. John G. Farmer, Department of Chemistry, University of Edinburgh, West Mains Road, Edinburgh EH9 3JJ, UK; E-mail: [J.G.Farmer@ed.ac.uk](mailto:J.G.Farmer@ed.ac.uk).



## Mineralogical Society of America Short Courses and Workshop

**Short Course: NANOPARTICLES IN THE ENVIRONMENT AND TECHNOLOGY** December 8 and 9, 2001, preceding the American Geophysical Union Meeting in San Francisco, CA Conveners: *Jillian F. Banfield*, Department of Geology & Geophysics, University of Wisconsin - Madison and *Alexandra Navrotsky*, Department of Chemical Engineering & Materials Science, University of California-Davis.

Nanoparticles are almost ubiquitous constituents of materials that comprise the Earth's surface and near-surface regions. They are common in atmospheric dust, they are present as suspended solids in water, and they are abundant in weathered rocks, soils, sediments, and volcanic ash. Nanoparticles are the predominant product of biomineralization reactions and are common in living organisms. The majority of the reactive surface area in the environment may be associated with nanoparticles. Through reactions such as adsorption, precipitation, dissolution, and catalysis on their surfaces, nanoparticles can control the form, distribution, and mobility of both contaminants and nutrients. Nanometer-scale particles are also important technologically, for example as catalysts, quantum-dot electronic devices, ion exchangers, battery materials, and starting materials for chemical syntheses. The aim of this short course is to introduce the concepts of size-dependent properties, processes, and behavior of nanoparticles, and to discuss the implications of phenomena associated with nanoparticles for materials science and earth and environmental science applications. The short course content and presentations will center on topics of common interest to the diversity of researchers interested in nanoscience and the format will foster linkages between researchers in these fields. The short course will be aimed largely at the geoscience community, but it will also be accessible to materials scientists and chemists interested in environmental problems.

### Topics and Speakers/Authors

Nanocrystals in the environment: What are nanocrystals? How they are formed in biological and inorganic processes? How are microstructure development and reactivity size-dependent? -- *Jillian Banfield (University of Wisconsin Madison)*  
 Nanocrystal energetics: Surface energy, thermodynamics, phase stability and metastability, energetic relations amongst phases in micropores and nanomaterials -- *Alexandra Navrotsky (University of California Davis)*  
 Nanocrystal morphology and surface reactivity: Mechanisms for control of nanocrystal shape; phase transitions in nanocrystals; Surface characterization of nanocrystals. -- *Paul Alivisatos (University of California Berkeley)*  
 Clusters in solution and at surfaces: kinetics of formation and dissociation, and isotope exchange. Will introduce general concepts of catalysis and refer to chapter 7 for specific example. -- *William Casey (University of California Davis)*  
 Molecular modeling: of nanocrystals and surfaces -- *James Rustad (PNNL)*  
 Structure and growth: Very small and non-crystalline nanoparticles:- structure and growth. -- *Glenn Waychunas (Lawrence Berkeley National Laboratory)*  
 Nanoparticles and atmospheric chemistry: Particles in the atmosphere, their mechanisms of formation and composition, sources, growth and effects on climate and visibility; effects on atmospheric composition, health effects, future directions in atmospheric nanoparticle research -- *Cort Anastasio (University of California Davis)*

**Short Course: STABLE ISOTOPE GEOCHEMISTRY** November 2 and 4, 2001, preceding the Mineralogical Society of America-Geological Society of America Annual meeting in Boston, MA. Conveners: *John W. Valley*, Dept. of Geology and Geophysics, University of Wisconsin and *David R. Cole*, Oak Ridge National Laboratory, Chemical & Analytical Science Division.

Stable Isotope Geochemistry is central to the study of the solid Earth, its atmosphere, hydrosphere, biosphere, and its extraterrestrial environment. New analytical technology of the past decade is revolutionary, causing wider application and more fundamental understanding. This short course will show how isotope ratios in minerals, rocks and fluids provide evidence for understanding a wide range of natural phenomena including: paleoclimate, marine sedimentation, geomicrobiology, biogeochemical cycles, thermal history, hydrothermal/metamorphic fluid flow, and igneous petrogenesis. Speakers will review these topics - with emphasis on O, C, H, and S isotopes - and the principles of equilibrium and kinetic isotope exchange.

### Topics and Speakers/Authors

Equilibrium oxygen, hydrogen, and carbon isotope fractionation factors applicable to geological systems -- *Tom Chacko and David R. Cole*  
 Rates and mechanisms of isotopic exchange -- *David R. Cole and Sumit Chakraborty*  
 Fractionation of the isotopes of carbon and hydrogen in biosynthetic processes -- *John M. Hayes*  
 Stable isotope variations in extraterrestrial material -- *Kevin D. McKeegan and L.A. Leshin*  
 Oxygen isotope variations of basaltic lavas and upper mantle rocks -- *John Eiler*  
 Stable isotope thermometry -- *John W. Valley*  
 Metamorphic fluid flow -- *Lukas Baumgartner and John W. Valley*  
 Stable isotopes in seafloor hydrothermal systems: Vent fluids, hydrothermal deposits, hydrothermal alteration, and microbial processes -- *W.C. Pat Shanks*  
 Isotopic ratios of precipitation: On beyond paleothermometry -- *Richard B. Alley and Kurt M. Cuffey*  
 Isotopic evolution of the biogeochemical carbon cycle during the Precambrian -- *David J. Des Marais*  
 Isotopic biogeochemistry of marine organic carbon -- *Katherine H. Freeman*  
 Biogeochemistry of stable sulfur isotopes -- *Donald Canfield*  
 Causes of stratigraphic variation in marine carbon isotope ratios -- *Robert L. Ripperdan*

**Workshop: PRACTICAL APPLICATION OF XRF TECHNIQUES TO THE ANALYSIS OF GEOLOGICAL MATERIALS** November 5, 2001 at the Philips Analytical application facility, Natick, MA during the Mineralogical Society of America-Geological Society of America Annual meeting

This one-day workshop is designed for both novice and experienced users of XRF techniques in geology, this workshop will focus on practical approaches to XRF analysis of soils, rocks, waters, petroleum-based products (oils, gasolines, etc.) and other types of materials typically encountered by geoanalysts. The course will emphasize practical exercises in sample preparation, calibration methods, and analysis of several different geological sample types. There is a limit of 20 participants and there is no fee.

More information about these short courses and workshop is available from the MSA website at [www.minsocam.org](http://www.minsocam.org) or the MSA Business Office, 1015 Eighteenth Street NW Ste 601, Washington, DC 20036-5212, USA. ph: 202-775-4344 fax: 202-775-0018 e-mail: [business@minsocam.org](mailto:business@minsocam.org). You may also register online.

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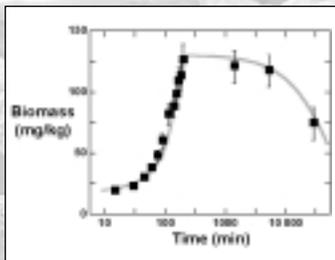
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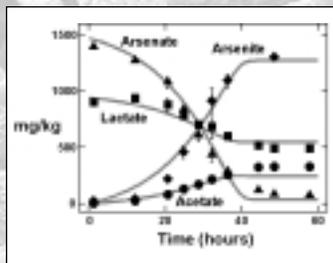
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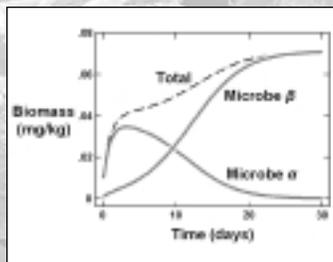
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