Newsletter of the Mineralogical Society of America Vol. 13, No.2, May 1997

The Lattice

GEOMICROBIOLOGY: INTERACTIONS BETWEEN MICROBES AND MINERALS

The mineralogical and geochemical characteristics of the crust, hydrosphere, and atmosphere have evolved in parallel with evolution of microorganisms. Microorganisms cause mineral precipitation and dissolution and control the distribution of elements in diverse environments at and below the surface of the Earth. Conversely, mineralogical and geochemical factors exert important controls on microbial evolution and the structure of microbial communities.

The Mineralogical Society of America is offering a Short Course on Geomicrobiology on October 18-19, 1997 in Alta, Utah. This course precedes the Mineralogical Society of America - Geological Society America Annual Meeting in Salt Lake City, Utah. The short course will teach geologists about the ways in which microbial activity impacts what have traditionally been considered inorganic processes and microbiologists and other life scientists about the mineralogical and geochemical aspects of biogeochemical systems.

Topics to be covered in the short course include the links between evolution of the Earth and microorganisms, new insights into microbial diversity in natural environments and the nature of early life forms, the structure, chemistry, and reactivity of mineral surfaces, the metabolic roles of metals and mechanisms used to modulate metal concentrations, microbial attachment to mineral surfaces and biofilm formation, microbial precipitation and the characteristics of biologically precipitated minerals, microbially-mediated mineral dissolution, and the impacts of microbial processes on geochemical cycles in soils and sediments.

Convenors of the Short Course are Jillian F. Banfield (Department of Geology and Geophysics, University of Wisconsin-Madison) and Kenneth Nealson (University of Wisconsin Great Lakes Institute, University of Wisconsin - Milwaukee). Additional information and registration materials are included in this issue of *The Lattice*.

19th FM-TGMS-MSA Mineralogical Symposium

The 19th Mineralogical Symposium sponsored jointly by the Friends of Mineralogy, the Tucson Gem and Mineral Show and the Mineralogical Society of America will be held in conjunction with the 44th Tucson Gem and Mineral Show on Saturday, February 14, 1998. The topic of the Symposium will be **Fluorite, and other Alpine Minerals** – the theme of the show. Papers on descriptive mineralogy, paragenesis, classic and new locations, etc. are invited. If interested in presenting a paper, write or call the Symposium co-Chairs: Robert B. Cook, Dept. of Geology, 210 Petrie Hall, Auburn Univ., Auburn, AL 36849; (334) 844-4282; e-mail: cookrob@mail.auburn.edu or Beau Jendon, Jendon Minerals, P.O. Box 6214, Rome, GA 30162-6214; (706) 235-9121; e-mail: jendon6214@aol.com. Upon acceptance of the topics, written abstracts will be due by Sept. 15, 1997. Abstracts will be published in the January-February issue of the Mineralogical Record.

Also in this issue

From the President

Letters from the president are generally pretty impersonal, but I would like to initiate at least a small crack in tradition with this one. On April 27, I turned 50 (ack!), and I also married Linda, a volcanologist and geochemist. As a result, you have a happy MSA president, but one who has recently been somewhat preoccupied with matters other than MSA. Thanks for celebrating the former, and I apologize for any dislocations resulting from the latter.

Although I had planned to devote all of my presidential letters to bits of electron microscopy and science history, I wish to take a detour here. As president, I have been surprised and humbled by the deep commitments and sacrifices that some of our members contribute to us all. I wish, therefore, to thank in this letter just a few of those who keep the MSA not only a crucial forum for scientific exchange, but also a close-knit family devoted to the mineralogical, petrological, and geochemical sciences.

Alex Speer has saved me from many dragons. As our scientific administrator and, for that matter, administrator of just about everything else, he is a target of choice for complaints when anything runs amiss, whether it be an errant book order or a problem in scheduling a room for an upcoming Short Course. Alex is not only an accomplished scientist, but he is also a superb director of our operations. I hope every member of our society will make a point of stopping by the MSA booth at Fall GSA to thank him for many contributions in running this Society.

Still listening? I've buried this jewel in the gangue of my letter. Gordon Brown, our Past President, recently heard that the NSF proposal he wrote for a greatly expanded MSA presence on the World Wide Web has been funded. In fact, it was funded at an even higher level than that requested in the original budget. Educational outreach via the internet is one of the most important functions of MSA and is essential to our long-term health as a society. Both John Brady, who has long run the current MSA Web site, and Gordon deserve our deep thanks for launching us into a new era of scientific outreach. We are now in the process of hiring a coordinator of internet services, and arrangements are being made to collaborate with the GSA and Geochemical Society in this new educational endeavor.

Barb Dutrow, our Secretary, has done a splendid and meticulous job in keeping the MSA running on a day-to-day basis. One dirty little secret is that there is relatively little that must be done by the president of MSA; it is the secretary who must make phone calls, send e-mail messages, and write letters literally by the hundreds, in order to keep our society intact and operational.

As I write this, Jill Banfield and Ken Nealson are in the throes of editing the Reviews in Mineralogy volume on geomicrobiology, as well as making final plans for the upcoming MSA Short Course on this topic. And, of course, Paul Ribbe will again be putting the volume together, as he has been doing since the dawn of this successful series. When I put the amphibole short course together in 1981, life was much simpler. Today, the Reviews are even more professionally done than they were fifteen years ago, and for financial reasons planning for short courses has become far more difficult. Thank you Jill, Ken, and Paul.

Probably the most important activity of the MSA is production of *American Mineralogist*. As we are now in the process of identifying new editors for our journal, this is a good time to thank Rich Reeder and Ted Labotka for the outstanding editorial job they have done for the past four years. This daunting task is surely also one of the most thankless one can imagine. No author likes to have a paper rejected or subjected to major revisions. It's easier, I think, to blame the editors for such hazards of the road than to realize that some papers deserve to be rejected or thoroughly reconstructed. Of course, when a paper is accepted, we tend to feel that it's because of the superior quality of our work and writing. Yes, journal editors are big targets but get little thanks. I encourage all of you to send both Rich and Ted a word of appreciation for difficult jobs well done.

Over the years, our newsletter, *The Lattice*, has increasingly become an essential source of information for MSA members. *The Lattice* is produced virtually single-handedly by Darrell Henry. (Darrell: you are not allowed to edit out this paragraph!) It is no easy task trying to squeeze presidential letters out of overcommitteds like myself four times a year, and one glance at this issue will tell you what a professional job Darrell is doing.

I could close by saying that the MSA performs many useful educational and scientific functions, but that would be a lie. It is not the Society but individual members who actually do the work, and I hope all of you will join me in thanking those who do the heavy lifting for us all.

David R. Veblen

David Veblen

President

Members in the News

Earl A. Riggs, Mississippi State Univ., has been named International Man of the Year 1996/1997 by the International Biographical Centre of Cambridge, England.

Member Volunteers needed for Fall AGU

MSA will again attend the Fall AGU Meeting in San Francisco on December 8-12, 1997. One Business Office staff member will be there to set up and oversee the MSA booth in the Exhibit Hall. However, he could use help. The booth is to showcase the Society, its programs (Awards, Lecture Program, Short Courses, Research Grants. etc.), publications, and encourage people to become members. If you are attending the AGU meeting and are interested in helping with the MSA booth, please contact J. Alex Speer, MSA Business Office, 1015 Eighteenth St., NW, Suite 601, Washington, DC 20036-5274, USA, phone 202-775-4344, E-mail: j_a_speer@minsocam.org.

ICDD Mineral Database

Jeffrey Post, MSA liason to the ICDD, is currently chair of the minerals subcommittee. This committee deals with all matters concerning the standard powder diffraction patterns for minerals and the range of products related to minerals sold by ICDD. MSA members are encouraged to pass on comments and suggestions regarding the ICDD mineral database to Jeffrey Post so that they might be discussed at the semi-annual meetings. Jeffrey Post can be contacted at Smithsonian Institution, Dept. Mineral Sciences, Nhb 119, Washington, DC 20560; e-mail: mnhms001@sivm.si.edu

In Memoriam

We regret to announce the passing of the following MSA Members. The Society extends its condolences to the family and friends of this scientist.

Joseph G. Cilen, Member (1970)
Lincoln Page, Life Member (1938)

The Lattice is published quarterly (February, May, August, November) by the Mineralogical Society of America. It is distributed to MSA members as a service. Articles and letters from readers are welcome.

The Mineralogical Society of America is composed of individuals interested in mineralogy, crystallography, and petrology. Founded in 1919, the Society promotes, through education and research, the understanding and application of mineralogy by industry, universities, government and the public.

Membership benefits include: *American Mineralogist*, published bi-monthly; 25% discount on volumes in the Reviews in Mineralogy series; *The Lattice*; Membership Directory; special subscription rates for *Mineralogical Abstracts, Physics and Chemistry of Minerals*, *Journal of Petrology*, and *Journal of Metamorphic Geology*; reduced registration fees at MSA short courses; member rates for the MSA/Geological Society of America annual meeting and member rates at MSA's spring meeting with the American Geophysical Union; participation in a Society that supports the many facets of mineralogy.

Dues for 1997 are $70 for professional members who elect to receive *American Mineralogist* and $40 for those who elect not to receive the journal, but who do receive all other membership benefits; membership is $30 for students. Membership is on a calendar year basis. Individuals who join after January 1, 1997 will be sent all back issues of the journal for volume 82, 1997.

For additional membership information and an application, and/or to receive a price list of the Society's publications, contact the Business Office.

Institutions may subscribe to the 1997 volume of *American Mineralogist* for the annual rate of $320 in the US, $325 in Canada and Mexico and $330 in all other countries. The subscription price includes any new volumes of the *Reviews in Mineralogy* series published during the calendar year of the subscription. Payment must be received in full before a subscription will be started.

INDUSTRIAL MINERALOGY GROUP WANTS TO HEAR FROM YOU

The Industrial Mineralogy Special Interest Group is seeking input from MSA members. If you are interested in the subject of how minerals and mineralogy are used in industry today, then I invite you to call me (908-205-6042) or send me a message (Fax: 908-205-5300; E-mail: fred.allen@engelhard.com) to share your thoughts. Please let me know if you would like to actively serve on this committee.

We are attempting to develop educational and outreach programs that describe the state of industrial and applied mineralogy throughout the world today. Mineralogy is a field that predates modern-day materials science, inorganic chemistry and solid-state physics. In fact, all three disciplines have roots in mineralogy. However, in our present high-tech society, these disciplines seem to overshadow mineralogy, and the boundaries between the fields have gotten fuzzy. This is not a bad thing, but it has caused some people to question the role that mineralogy plays in industry, as well as in academia, today.

Synthetic materials are now used in most industrial applications. These generally perform better and are often cheaper to process than naturally occurring minerals. But many of these synthetic materials are related to or derived from minerals with known crystal structures and chemical compositions, such as spinel, perovskite, garnet, cordierite, zeolites and clays.

The development of several commercially important synthetic materials can be traced to earlier work done on minerals. Minerals are classified on the basis of structure and composition, but are characterized by their properties: optical, thermal, electrical, magnetic, mechanical, sorptive, catalytic, etc. Knowledge of certain key properties has allowed scientists to solve major technological problems confronting society over the years. Structure and composition control properties, which in turn affect performance in an application.

Consider the example of zeolites. The first gas adsorption experiments on zeolite molecular sieves were made on zeolite minerals in the mid-1940's. In 1948, the first industrial research efforts at Union Carbide resulted in the synthesis and production of synthetic molecular sieves that had never been found to exist as minerals. This controlled synthesis was a major research achievement. Today, there are 40 or so identified species of zeolite minerals and over a hundred types of synthetic zeolites. Of these, only a few have practical significance at the present time, but their manufacture and use are responsible for billions of dollars worth of business.

There are about 3,500 species of minerals found on Earth (and a few with extraterrestrial origins). However, only a small number of these are actually exploited in technological applications. A few minerals are used as-is, but most are processed (structurally and/or chemically modified) before use, e.g., kaolin clay in paper coating and filler applications. Like the zeolite molecular sieves, other minerals have synthetic analogs or structural derivatives that are employed in industry: anatase and rutile (titania) pigments; spinel (Cu-chromite) catalysts; perovskite (YBCO) superconductors; garnet (YAG) lasers; cordierite monoliths, etc.

It's not easy to predict where the next major material discoveries may come from or what breakthrough technological problems await. Are there minerals and related synthetic materials with novel properties that should be explored for use in existing commercial applications? The answer is, *yes*! The primary function of the Industrial Mineralogy group is to address these issues and to educate our scientists, business people, politicians and students as to what the future possibilities might be.

The Industrial Mineralogy group is focusing on the topics listed below. Please let me know if you are interested in any of these or other related topics.

- Industrial uses of minerals and their synthetic analogs (metals, oxides, zeolites, clays, etc.)
- Mineral characterization and testing (measuring properties and performance)
- Minerals as commodities (natural resources and raw materials; mineral economics)
- Finding new technological applications for minerals: does history predict the future?

Fred Allen
Engelhard Corporation
Iselin, NJ

New e-mail addresses

There are a few new e-mail addresses of note. The new e-mail address for Darrell Henry, *The Lattice* Editor, is glhenr@unix1.sncc.slu.edu. The new e-mail addresses for Alex Speer, MSA Business Office, are business@minsocam.org and j_a_speer@minsocam.org. Watch for updates and possible address changes to *The Lattice* and MSA web-sites.

Mineralogical Society of America Short Course Announcement

GEOMICROBIOLOGY:
INTERACTIONS BETWEEN MICROBES AND MINERALS

Dates: October 18-19, 1997 (preceding the Mineralogical Society of America - Geological Society of America Annual meetings in Salt Lake City, Utah)

Location: Short Course sessions are October 18-19, between 8:00 am - 5:00 p.m. The sessions will be held at the Alta Peruvian Lodge, P.O. Box 8017, Alta, Utah 84092, Telephone: 801-742-3000, Fax: 801-742-3007.

Convenors: *Jillian F. Banfield*, [before 9/12/97] Graduate School of Science, Mineralogical Institute, University of Tokyo, hongo, Bunkyo-ku, Tokyo 113, JAPAN, E-mail: jill@min.s.u-tokyo.ac.jp [after 9/12/97] Department of Geology & Geophysics, University of Wisconsin, 1215 W. Dayton Street, Madison, WI 53706, E-mail: jill@geology.wisc.edu

Kenneth Nealson, University of Wisconsin Great Lakes Institute, University of Wisconsin-Milwaukee, knealson@csd.uwm.edu

Fees:

		before 9/17/97	*after 9/17/97*
Professional Registration:	Member	$270	$320
	Non-member	$340*	$390*
Student Registration:	Member	$210	$260
	Non-member	$240*	$290*
Speaker		none	none

* includes MSA membership dues for 1998.

Registering: Registration forms are available from the MSA Business Office, 1015 Eighteenth Street, N.W., Suite 601, Washington, D.C. 20036-5274, USA. Telephone: 202-775-4344 Fax: 202-775-0018 E-mail: business@minsocam.org; or from the MSA Home Page http://geology.smith.edu/msa/msa.html. Registration forms must be returned to the MSA Business Office with payment. Registration is limited to 100 participants. All participants and speakers must register.

Practical: Registration fee includes MSA short course sessions, all meals including refreshments at breaks and the Saturday evening banquet, and the *Reviews in Mineralogy* volume. There is welcoming reception Friday evening, October 17 at the Alta Peruvian Lodge. Registration fee does not include room, other incidentals, or transportation costs to or from Alta. Both participants and speakers must make and pay for their own lodging arrangements. Contact the Alta Peruvian Lodge, P.O. Box 8017, Alta, Utah 84092, Telephone: 801-742-3000, Fax: 801-742-3007. Indicate if and with whom you will share a room. Blocks of rooms have been reserved until September 17, 1997:

Available Rooms and Charges for 2 nights stay:

	single	*sharing*
Alpine & Chalet Rooms	$130.66	$ 65.33
Nordic Room	$ 86.37	$ 43.20
Dorm Rooms	---	$ 33.22
Snowbird Lodge (overflow)	$152.80	$ 76.40

Rooms are on a first come first serve basis and prices include taxes.

Ground transportation to and from the Salt Lake City International Airport is available. The service is Alta Ski Shuttle (1-800-742-3406), which runs all day. Cost $17.

Support Limited outside support for students may be available. If you need financial assistance to cover registration, contact the MSA business office with your name and E-mail address.

Topics and Speakers/Authors

Introduction: where here has the field come from and where is it going?	*Catherine Skinner*:
Evolution of the Earth and biogeochemical cycles	*David DesMarais*:
Microbial diversity in modern subsurface, ocean, surface environments	*Sue Barns and Sandra Nierswicki-Bauer*:
Minerals in the near surface - the structure and reactivity of mineral surfaces	*Jillian Banfield and Robert Hamers*:
The role of metals in microbial energy cycles	*Simon Silver and Dianne McKnight*:
Bacterial attachment to mineral surfaces	*Brenda Little and Zbigniew Lewandowski*:
Biologically-mediated mineral precipitation: molecular genetics	*Bradley Tebo and W. Ghiorse*:
Surface-mediated mineral development by bacteria	*D. Fortin, F.G. Ferris, and T.J. Beveridge*:
Algal precipitation of carbonates, silica, and silicates	*Elisabeth W. de Vrind-de Jong and Johannes P.M. de Vrind*:
Biological mineral oxide mineral dissolution: metabolic and geochemical options	*Alan Stone with Ken Nealson*:
Biologically mediated dissolution of metal sulfides	*Kirk Nordstrom and Gordon Southam*:
Biologically mediated dissolution of silicate minerals	*William Barker , Susan Welch, and Jillian Banfield*:
Microbially mediated element cycles in sediments and soils	*Kenneth Nealson and David Stahl*:

The short course will be held in conjunction with an MSA Geomicrobiology Symposium and theme session on Monday, October 20, 1997 at the Mineralogical Society of America - Geological Society of American Annual Meeting, Salt Lake City, Utah.

For further short course information and registration, contact the MSA Business Office, 1015 Eighteenth Street, N.W., Suite 601, Washington, D.C. 20036-5274. Phone: 202-775-4344. Fax: 202-775-0018 E-mail: business@minsocam.org or visit the MSA Home Page: http://geology.smith.edu/msa/msa.html

Related MSA Theme Sessions and symposia at GSA

MSA will sponsor symposia and theme sessions on three differing topics at the 1997 GSA meeting in Denver, Colorado. The MSA Symposium and an associated Theme Session are on the topic of the MSA Short Course: Geomicrobiology: interactions between microbes and minerals on Monday, October 20, 1996. In addition, there will be symposia and theme sessions on Environmental Mineralogy, jointly sponsored with the Clay Mineral Society, and Volatiles in Planetary Mantles and Basalts as a result of efforts by MSA's Planetary Materials interest group.

THE DEADLINE FOR THE AUGUST ISSUE OF THE LATTICE IS JULY 30
Contributions may be sent to Darrell Henry via surface mail at Department of Geology and Geophysics, Louisiana State University, Baton Rouge, LA 70803 or via E-mail at glhenr@unix1.sncc.lsu.edu.

Mineralogical Society of America Short Course
Geomicrobiology: Interactions between Microbes and Minerals
Alta, Utah - October 18-19, 1997

Complete and return this registration form to the MSA Business Office, 1015 Eighteenth Street, N.W., Suite 601, Washington, D.C. 20036-5274, USA. Telephone: 202-775-4344. FAX: 202-775-0018. Please type or print. Use one form per registrant. Payment must accompany this form. Registration is limited to 100 people on a first-come, first-served basis. Payment must accompany this form, which will be fully refunded if cancellation is received in writing prior to September 17, 1997.

Name _____
(first) (middle) (last)

Address _____

_____

_____
(city) (state) (zip/postal code) (province) (country)

Telephone: (Voice) _____ (Fax) _____

E-mail: _____

Registration fee includes MSA short course sessions, all meals including refreshments at breaks and the Saturday evening banquet, and the *Reviews in Mineralogy* volume. There is welcoming reception Friday evening, October 17 at the Alta Peruvian Lodge. Registration fee does not include room, other incidentals, or transportation costs to or from Alta. Both participants and speakers must make and pay for their own lodging arrangements. Prices and rooms available are described in the accompanying announcement. Contact the Alta Peruvian Lodge, P.O. Box 8017, Alta, Utah 84092, Telephone: 801-742-3000, Fax: 801-742-3007. Indicate if and with whom you will share a room. Blocks of rooms have been reserved until September 17, 1997. Information on the short course, lodging, ground transportation, and course updates are on the MSA Home Page (http://geology.smith.edu/msa/msa.html).

Registration. Mark the appropriate registration category [X] and write the appropriate fee on the cost line:

Professional Registration:	before 9/17/97	after 9/17/97	cost
[ ] Member	$270	$320	_____
[ ] Non-member	$340*	$390*	_____
[ ] Speaker	no cost	no cost	_____
Student Registration:	**before 8/31/96**	**after 9/1/96**	
[ ] Member	$210	$260	_____
[ ] Non-member	$240*	$290*	_____

* includes MSA membership dues for 1998. Total Due $_____

Amount Enclosed (Indicate payment method and amount of payment enclosed)

[ ] Enclosed is a check (in US $ drawn on a US bank) or money order in the amount of $_____

[ ] Charge my: ____ Visa ____ Mastercard ____ Diner's Club ____ American Express card
(Your credit card will be charged when the registration form is processed) in the amount of $_____

_____ _____
(card number) (name on card -- please print)

_____ _____
(signature) (exp. date)

Meeting Calendar 1997-1998

1997

June

2-6 **7th Annual V. M. Goldschmidt Conference.** Tucson, Arizona. *Details*: Michael Drake, Dept. of Planetary Sci., Lunar and Planetary Inst., Univ. of Arizona, Tucson, AZ 85721. Tel.: (520) 621-6962; Fax: (520) 621-4933; E-mail: goldconf@lpl.arizona.edu WWW:http://cass.jsc.nasa.gov/meetings/gold/gold.intro.html .

2-6 **13th International Conference on Basement Tectonics.** Blacksburg, Virginia. *Details*: A. K. Sinha, Dept. of Geological Sciences, Virginia Polytechnic Inst., Blacksburg, VA 24061. Tel.: (540)-231-5580, E-mail: searches@vtwm1.cc.vt.edu or sentelle@vt.edu , WWW: http://www.geol.vt.edu/profs/aks/basement.html.

15-21 **The 11th International Clay Conference and The 34th Annual Meeting of the Clay Minerals Society.** Ottawa, Ontario, Canada. *Details*: Jeanne B. Percival, Secretary-General, 11th ICC, Geological Society of Canada, 601 Booth St., Ottawa, Ontario K1A 0E8, Ontario, Canada. Fax: (613) 943-1286; E-mail: icc97@gsc.emr.ca and Hideomi Kodama, Center for Land and Biological Research, Agriculture Canada C.E.F., Ottawa, Ontario K1A 0C6, Canada. Tel.: (613)-995-5011; Fax: (613)-995-1823, E-mail: kodama@ncccot.agr.ca .

8-11 **EuroMin '97 European industrial Minerals and Markets.** Barcelona, Spain *Details*: Tracey Hicks, Industrial Minerals Information Ltd, Marketing Dept., Park Haouse, Park Terrace, Worcester Park, Surrey KT4 7HY. Tel.: 44 (171)-827-9977, Fax: 44 (181)-337-8943, E-mail: 100635.2433@compuserve.com. WWW: http://www.mineralnet.co.uk.

20-25 **"Tourmaline 1997" - International Symposium on Tourmaline.** Moravia, Czech Republic. Technical Session (June 20-22) and Field Trip (June 23-25). *Details*: M. Novák, Dept. of Mineralogy and Petrography, Moravian Museum, Zelný trh 6, 659 37 Brno, Czech Republic. Fax: (05) 4221 2792; E-mail: mzm@mzm.anet.cz and F. C. Hawthorne, Dept. of Geological Sci., Univ. of Manitoba, Winnipeg, R3T 2N2, Manitoba, Canada. Fax: (204) 261-7581; E-mail: fchawthorn@bldgwall.lan1.umanitoba.ca

July

1-4 **ECROFI XIV.** Nancy, France. *Details*: XIV ECROFI, CREGU, BP 23, 54501-Vandœuvre-lès-Nancy Cedex, France. Tel.: (33) 03-83-44-19-0, Fax: (33) 03-9440029, E-mail: ecrofi@cregu.cnrs-nancy.fr.

17-19 **Lunar and Planetary Workshop on Parent Body and Nebular Modifications of Chondritic Materials.** Maui, Hawaii. . *Details*: M. Zolensky, Tel.: (713)-483-5128, E-mail: zolensky@snmail.jsc.nasa.gov or E. Scott, Tel.: (808)-956-3955, E-mail: escott@kahana.pgd.hawaii.edu or S. Krot, (808)-956-3900, E-mail: sasha@kahana.pgd.hawaii.edu .

20-24 **5th International Symposium on Hydrothermal Reactions (ISHR '97).** Gatlinburg, Tennessee. *Details*: ISHR '97, ORNL, P.O. Box 2008, Building 4500S, MS 6110, Oak Ridge, TN 37831-6110. Tel.: (423)-576-5109; Fax: (423)-574-4961; E-mail ddp@ornl.gov ; WWW: http://flory.engr.utk.edu/ishr97.

20-25 **American Crystallographic Association Annual Meeting.** St. Louis, Missouri. *Details*: Marcia Vair, Tel. (716)-856-9600, ext. 321; E-mail: marcia@hwi.buffalo.edu .

August

10-15 **Gordon Research Conference on Dynamic Metamorphism: The Interaction of Deformation and Mineral Reactions.** Colby-Sawyer College. New London, New Hampshire. *Details*: Harry W. Green II or Brian Evans. WWW: http://web.mit.edu/brievans/www/PPEM/ .

10-15 **Gordon Research Conference on Inorganic Geochemistry: Ore Deposits.** New Hampton School, New Hampton, New Hampshire. *Details*: Mark Reed, Dept. of Geological Sciences, Univ. of Oregon, Eugene, OR 97403-1272. Tel.: (541) 346-5587; Fax: (541) 346-4692; E-mail: mhreed@oregon.uoregon.edu ; or Kevin Shelton, Dept. of Geological Sciences, Univ. of Missouri, Columbia, MO 65211. Tel.: (573) 882-6568, Fax: (573) 882-5458; E-mail: geosckls@showme.missouri.edu ; or Robert Schafer,

Kinross Gold Corporation, Toronto, Ontario, Canada. Tel.: (416)-365-7883, Fax: (416)-363-6622, E-mail: bobs@kinross.com .

19-20 IMA Working Group in Mineral Equilibria and Data Bases. Helsinki, Finland. *Details*: Pentti Holtta, Geol. Surv. Finland, SF-02150 Espoo, Finland. Tel.: 358-0-469323-12; Fax: 358-0-462205; E-mail: pentti.holtta@gsf.fi or Leonid L. Perchuk, Geological Faculty, Moscow State Univ., Vorobievy Gory 119899, Russia. Tel.: 7-095-913-2112; Fax: 7-095-939-1395; E-mail: llp@geol.msu.ru or llp@p1854.home.chg.ru. WWW: http://www.gsf.fi/meq.htm.

22-23 International Pressure Calibration Workshop. Misasa, Japan. *Details*: Dean C. Presnall, Dept. of Geosciences, Univ. of Texas at Dallas, P.O. Box 830688, Richardson, TX 75083-0688. Tel.: (972) 883-2444; Fax: (972) 883-2829; E-mail: presnall@utdallas.edu.

24-29 Second International Symposium on Granites and Associated Mineralizations. Brazil. *Details*: General Secretartiat SGM-ISGAM, Av. 3, 390 Platforma IV, CAB, 41.746-900, Salvador, Bahia, Brazil. Tel.: 55-71-370-6274, Fax: 55-71-231-5655, E-mail: isgam@npd.ufpe.br .

26-28 Modeling Reactions and Reactive Transport in Geochemical Systems. Urbana, Illinois. *Details*: Craig Bethke, University of Illinois, Dept. of Geology, 1301 West Green St., Urbana, IL 61801. Tel: (217)-333-3369 or (217)-244-4068, Fax: (217)-244-4996, E-mail: c-bethke@uiuc.edu

August-September

30-5 Lunar and Planetary Institute Second International Conference on Large Meteorite Impacts and Planetary Evolution. Sudbury, Ontario, Canada. *Details*:Burkhard Dressler. Lunar and Planetary Institute, 3600 Bay Area Boulevard, Houston TX 77058-1113. Tel. (713)-486-2112, Fax:

(713)-486-2162, WWW: http://cass.jsc.nasa.gov/lpi.html .

31-4 **XVII Conference on Applied Crystallography.** Katowice, Poland. *Details*: Danuta Stroz, Institute of Physics and Chemistry of Materials, University of Silesia, ul. Bankowa 12, 40-007 Katowice, Poland. Fax: 48-32-596929, E-mail: dana@usctoux1.cto.us.edu.pl.

September

1-5 **"Challenges to Chemical Geology" - 10th Meeting of the European Geological Societies.** Carlsbad, Czech Republic. *Details*: Martin Novák, Czech Geol. Survey, Geologicka 6, 15200 Prague 5, Czech Republic. Tel.: 42-2-581-71-20; Fax: 42-2-581-87-48; E-mail: novak@cgu.cz.

1-7 **Fifth International Eclogite Conference**. "Centro Stefano Franscini", Monte Verita, Ascona, Switzerland. *Details*: Rolf Schmid, Mineralogy, IEC 97, ETH-centre, NO E43, 8092 Zurich, Switzerland. Tel. direct: XX41 1 6323791, Tel. secr.: XX41 1 6323779; Fax: XX41 1 6321088; E mail: rolf@erdw.ethz.ch ; WWW: http://www.erdw.ethz.ch/~rolf/pre_reg.html

4-5 **Metamorphic Studies Group and Applied Mineralogy Group Workshop on "Applying Hydrogeology and Fluid Flow Modeling to Metamorphic and Ore Systems"** Leeds, UK. *Details*: Bruce Yardley, Dept. of Earth Sciences, University of Leeds, Leeds LS2 9JT, UK. Fax: +44 (0)113 2335259, E-mail: bruce@earth.leeds.ac.uk

8-10 **COM/IMA short course: "Modern Approaches to Ore and Environmental Mineralogy".** S. Mamede de Infesta, Portugal. *Details*: Dr. Orlando C. Gaspar, Laboratsrio do IGM, Apartado 89,4465 S. Mamede de Infesta, Portugal. Tel.+ 351 2 951 19 15, Fax + 351 951 40 40

21-29 **Zeolite '97: 5th Conference on the occurrence, properties and utilization of natural zeolites.** Naples, Italy. *Details*: M. Adabbo, Secretary Zeolite'97, DIMP-Chimica Applicata, Universita Federico II, Piazzale V. Tecchio 80, 80125 Napoli, Italy. Tel.: (39)-81-7682550, Fax: (39)-81-7682394, E-mail: colella@uninia.it. WWW: http://www.vol.it/ing/zeolite/zeolite.htm .

October

5-10 **Fourth International Symposium on Environmental Geochemistry**. Vail, Colorado. *Details*: 4th ISEG, c/o USGS/CEGG, Federal Center, Box 25046, MS 973, Denver, CO 80225. Tel.: (303) 236-3200, E-mail: iseg@helios.cr.usgs.gov .

10-13 **International Workshop on Continetal Roots.** Cambridge, Massachusetts. *Details*: Bill McDonough, Earth and Planetary Sciences, Harvard University, 20 Oxford St., Cambridge, MA 02138. Tel.: (617) 496-2010, Fax: (617) 496-0434. E-mail: mcdonough@eps.harvard.edu. *(Abstract deadline: September 1, 1997)*

20-23 **Geological Society of America Annual Meeting**. Salt Lake City, Utah. *Details*: GSA, P.O. Box 9140, Boulder, CO 80301. Tel.: (303) 447-2020, Fax: (303) 447-1133, WWW: http://www.geosociety.org/meetings/97/index.htm . *(Abstract deadline: July 8, 1997)*

November

12-13 **Rates and Timescales of Magmatic Processes**. London, United Kingdom. *Details*: Nick Rogers, Geological Society of London, London, UK. Tel.: 1908-653013, Fax: 1908-655151, E-mail: n.w.rogers@open.ac.uk .

13-14 **Clay Mineral Evolution, Basin Maturity and Mudrock Properties.** Nottingham, United Kingdom. *Details*: Dick Merriman or Simon Kemp, British Geological Survey, Keyworth, Nottingham NG12 5GG, UK. Tel.: 01159-363417 or 01159-363448, Fax: 01159-363352, E-mail: r.merriman@bgs.ac.uk or s.kemp@bgs.ac.uk. .

December

5-9 **Merapi Decade Volcano International Workshop II.** Yogyakarta, Indonesia. *Details*: Merapi Decade Volcano Workshop II Secretariat, Volcanological Survey of Indonesia, Jl. Diponegoro No. 57 Bandlung - 40122, Indonesia. Tel. +62-22-772606, 774706; Fax: +62-22-702761; E-mail: vsimo@ibm.net or merapi@vsi.dpe.go.id.

8-11 **Fall American Geophysical Union Meeting.** San Francisco, California. *Details*: AGU meetings department, 1997 Fall Meeting, 2000 Florida Ave., NW, Washington, D.C. 20009. Tel.: (202)-462-6900 or 1-800-966-2481 (in USA), Fax: (202)-328-0566, E-mail: meetinginfo@kosmos.agu.com., WWW: http://www.agu.org/meetings/fm97call.html. *(Abstract deadline: Sept. 3, 1997)*

1998

February

15-19 **Symposium on the Status of Global Energy Resources.** San Antonio, Texas. *Details*: Don Hausen, 1767 South Woodside Drive, Salt Lake City, Utah 84124. Tel. (801)-277-0883, Fax: (801)-277-0612, E-mail: mjoanh@aol.com .

March-April

30-4 **International Association of Geochemistry and Cosmochemistry, Water-Rock Interaction - 9.** Taupo, New Zealand. *Details*: B. W. Robinson. Wairakei Research Centre,Institute of Geological & Nuclear Sciences, Private Bag 2000, Taupo, New Zealand Tel.: 64-7-374-8211. Fax: 64-7-374-8199, E-mail: wri-9@gns.cri.nz , WWW: http://www.ruamoko.gns.cri.nz/wri-9.html.

April

13-17 **7th International Kimberlite Conference.** Rondebosch, South Africa. Field trips April 6-12 and April 19-24. *Details*: J. Gurney, 7IKC, Dept. of Geol. Sci., University of Cape Town, Private Bag, Rondebosch, 7700, South Africa. Tel.: 27-21-531-3162 or 27-82-550-2004; Fax: 27-21-650-3783; E-mail: 7ikc@geology.uct.ac.za ; WWW: http://www.uct.ac.za/depts/geolsci/7ikc .

May

18-20 **Geological Association of Canada/Mineralogical Association of Canada.** Quebec, Canada. *Details*: A. Morin, Dept. Geologie et de genie geologique, Universite Laval, Pavillon Adrein-Pouliot Sainte-Fay, Quebec, G1K 7P4 Canada. Tel.: (418) 656-2193; Fax: (418) 656-7339; E-Mail: quebec1998@ggl.ulaval.ca ; WWW: http://www.ggl.ulaval.ca/quebec1998.html .

June-July

28-3 **The Interior of the Earth.** Henniker, New Hampshire. *Details*: M. Gurnis, Seismology Lab, Caltech, Pasadena, CA 91125. Tel.: (818)-395-6979, Fax: (818)-564-0715.

29-15 **8th International Platinum Symposium (IAGOD/CODMUR).** Johannesburg, South Africa. *Details*: Dr. C. A. Lee, P.O. Box 68108, Bryanston, South Africa. Tel.: 27-1127-373-2580; Fax: 27-1127-836-0371; E-mail: clee@amplats.co.za

July

5-10 **18th International Congress on Glass.** San Francisco, California. *Details*: 18th International Congress on Glass, The American Ceramic Society, 735 Ceramic Place, Westerville, OH 43081. E-mail: icgxviii@acers.org , WWW: http://www.acers.org

August

10-14 **17th General Meeting of the International Mineralogical Association**. Toronto, Canada. *Details*: A. J. Naldrett, Dept. of Geology, University of Toronto, Toronto, Canada M5S 3B1 Tel.: (416) 978-3030: Fax: (416) 978-3938; E-mail: ima98@quartz.geology utoronto.ca.

10-16 **International Ophiolite Symposium and Field Excursion: "Generation and Emplacement of Ophiolites through Time".** Oulo, Finland. *Details*: J. Vuollo, Dept. of Geology, University of Oulu, FIN-90570 Oulu, Finland. Fax: 358-81-5531484; E-mail: vuollo@sveka.oulu.fi *or* E. Hanski, Geol.

Survey of Finland, P.O. Box 77, FIN-96101 Rovaniemi, Finland. Fax: 358-60-3297289; E-mail: eero.hanski@gsf.fi .

October

4-8 Symposium APIFIS (Asian and Pacific International Fluid Inclusion Society) II, Tashkent, Uzbekistan, *Details*: Organizing committee, Block VII-47-40, Chilansar,Tashkent,96,700096,Uzbekistan CIS. Tel: +7 (3712) 78-06-30; +7 (3712) 33-70-69, , Fax: +7 (3712) 33-49-01 E-mail: mir@saturn.silk.org

26-29 Geological Society of America Annual Meeting. Toronto, Canada. *Details*: Geological Society of America, 3300 Penrose Place, Boulder, CO 80301. Tel.: (303)-447-2020, Fax: (303)-447-1133, WWW: http://geosociety.org/meetings/index.htm .

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The following new members and students have joined MSA. We welcome them to the Society. The areas of interest on the application form have been increased in an attempt to cover the increasingly broader interests of our membership. They are: Mineralogy (MI), Crystallography/Crystal Chemistry (CC), Material Properties (PP), Igneous Petrology (IP), Metamorphic Petrology (MP), Sedimentary Petrology (SP), Geochemistry (GE), Phase Equilibria (PE), Economic Geology (EG), Clay Mineralogy (CM), Industrial Mineralogy (IM), Environmental Mineralogy (EM), Gems (GM), Planetary Materials (PM), Teaching (TC), Topologic Mineralogy (TP), and Others as indicated.

If you know of someone who would like to join MSA, a membership application appears in this issue of *The Lattice* or may be obtained from either MSA's home page (http://geology.smith.edu/msa/msa.html) or the MSA Business Office, 1015 Eighteenth Street N.W. Ste. 601, Washington, DC 20036-5274.

Altenberger, Uwe, Postfach 601553, Universitat Potsdam, D-14415 Potsdam, GERMANY. Ph: +49 331 977 2895. Fax: +49 331 977 2087. Email: altenberger@persius.rz.uni-potsdam.de. (M-97) MI PP MP GE TC Microfabrics.

Belakovskiy, Dmitriy Ilych, Fersman Mineralogical Museum, Leninskiy Prospect 18-2, 117071 Moscow, RUSSIA. Ph: 095 952-0067. Fax: 095 952-4850. Email: dmz@minmuz.msk.su. (M-97) MI CC.

Berti, Alberto, via Delle Ande, 5, 20151 Milano, ITALY. Ph: +39 2 308 5558. (M-97) MI CC.

Bishop, Janice L., NASA - Ames Research Center, Mail Stop 239-4, Moffett Field, CA 94035, USA. Fax: (415) 604-1088. Email: bishop@terra.pe.ba.dlr.de. (M-97) PM MI CM.

Brown, Mary Anne, Department of Geology, University of Maryland at College Park, College Park, MD 20742, USA. Ph: (301) 405-4085. Fax: (301) 314-9661. Email: maryanne@geol.umd.edu. (S-97) MO IP.

Currie, Charles E., 1752 N. Kirsten Lee Drive, Westlake Village, CA 91361, USA. Ph: (818) 597-8910. (M-97) EG IM EM.

Dong, Hailiang, Department of Geological Sciences, University of Michigan, Ann Arbor, MI 48109, USA. Ph: (313) 936-3601. Fax: (313) 763-4690. Email: hailiang@umich.edu. (S-97) MI CC PP SP GE PE EG CM IM EM GM PM TC TP.

Hauser, Markus, Albrechtstrasse 58 A, D-12167 Berlin, GERMANY. Ph: +49 30 795 7993. Fax: +49 30 838 34 Email: mhauser@chemie.fu-berlin.de. (S-97) PP IP MP GE.

Lee, Su-jeong, Yonsei University, Department of Geology, 134 Shinchon-dong, Seodaemun-Ku, 120-749 Seoul, KOREA. Fax: +82 02 392 6527. (M-97).

Libowitzky, Eugen, Institut fur Mineralogie und Kristallographie, Universitat Wien - Geozentrum, Althanstrasse 14, A-1090 Wien, AUSTRIA. Ph: +43 1 31336 1850. Fax: +41 1 31336 783. Email: eugen.libowitzky@univie.ac.at. (M-97) MI CC PP TC Optics.

McFarlane, Christopher R.M., Department of Geology & Geophysics, University of Calgary, 2500 University Drive, NW, Calgary, Alberta, T2N 1N4 CANADA. Ph: (403) 220-3458. Email: farlane@geo.ucalgary.ca. (S-97) MP MI PE IP EG. Sponsored by David Pattison and Edward Ghent.

Metcalf, James R., 700 College Street, Box 612, Beloit College, Beloit, WI 53511, USA. Ph: (608) 363-4201. Email: metcalfj@stu.beloit.edu. (S-97) MP TC.

Perigault, Juan Gabriel, P.O. Box 13004, Stanford, CA 94309, USA. Ph: (415) 723-1478. Fax: (415) 725-3162. Email: gabriel@leland.stanford.edu. (S-97) GE EM Environmental Sciences.

Pratesi, Giovanni, Istituto Geofisica Toscano, Via Marengo 49/A, I-50047 Prato, ITALY. Ph: +39 574 23018. Fax: +39 574 605871. Email: igt@dada.it. (M-97) MI CC PP PE EM.

Richet, Pascal, Institut de Physique du Globe, 4 Place Jussieu, 7505 Paris, FRANCE. Ph: +33 14427 4938. Fax: +33 14427 2487. Email: richet@ipgp.jussieu.fr. (M-97) CC PP IP PE.

Salyer, Pamela Anne, 1215 Los Angeles Drive, El Paso, TX 79902, USA. Ph: (915) 542-3818. Email: pam@geo.utep.edu. (S-97) MI CC PP .

Shull, Jr., James Lee, Fuel Cell Technology, Westinghouse Science and Technology Center, 1310 Beulah Road, Pittsburgh, PA 15235, USA. Ph: (412) 256-1699. Fax: (412) 256-2012. Email: wx-shulljl@westinghouse.com. (M-97) CC PP PE TC.

Smith, Linda V., P.O. Box 518, Snoqualmie, WA 98065, USA. Ph: (206) 888-1128. (S-97) MI GE.

Smith, Kyle David, P.O. Box 26616, Tempe, AZ 85285, USA. Ph: (602) 380-8027. Fax: (602) 807-9891. (S-97) MI CC IM EM TP.

Sukumarannair, Ajith Kumar, SMU Box 752441, Dallas, TX 75275-2441, USA. Ph: (214) 891-9871. Email: ajith@post.smu.edu. (S-97) MP PE GE GM.

Weise, Christian, Orleanstrasse 69, D-81667 Munchen, GERMANY. Ph: +49 89 480 2933. Fax: +49 89 688 6160 (M-97).

Wiesli, Rene A., 3700 Sutherland Ave. A-5, Knoxville, TN 37919, USA. Ph: (423) 909-0955. Email: rwiesli@utkux.edu. (S-97) MP IP.

Worley, Brenton Alan, School of Earth Sciences, University of Melbourne, Parkville, Victoria 3052, AUSTRALIA. Ph: +61 3 9344 6535. Fax: +61 3 9344 7761. Email: b.worley@earth_sciences.unimelb.edu.au. (M-97) PE MI MP Geodynamics, Tectonics, Diffusion.

Xu, Hongwu, Department of Geosciences, Princeton University, Princeton, NJ 08544, USA. Ph: (609) 258-[illegible]04. Fax: (609) 258-1274. Email: hongwuxu@princeton.edu. (S-97) MI CC PP PE EM.

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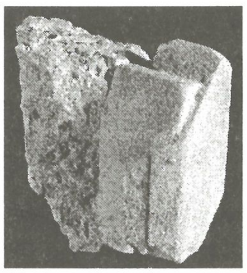

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