

The Lattice

The Annual MSA Awards Luncheon

Cincinnati, October 27, 1992



Roebling Medalist Hatten Yoder and President Michael Holdaway.



Jonathan Stebbins, recipient of the MSA Award, is pictured with his citationist, Gordon Brown, and President Michael Holdaway.



Hatten Yoder, the 1992 Roebling Medalist, his citationist Gary Ernst, and President Michael Holdaway.



Our Society's new President Alexandra Navrotsky and Past-President Michael Holdaway.

MSA News

The results of the 1993 MSA election for officers and councillors are as follows: Alexandra Navrotsky - President, Bernard W. Evans - Vice President, Rosalind Helz - Treasurer, John B. Brady, Edward S. Grew, Anne M. Hofmeister, and Jack M. Rice - Councillors for 1993-94. Stephen Guggenheim will remain in office as Secretary.

The recipient of the 1993 Roebling Medal will be Brian Mason and Lukas Baumgartner will receive the 1993 MSA Award. Paul Ribbe will receive the 1993 Public Service Award.

The 1992-93 MSA Lecture Program, supervised by Henry O.A. Meyer, will have Jane Selverstone and Sorena Sorensen as Lecturers. Through a joint arrangement between MSA and the NSF Science and Technology Center for High Pressure Research (CHiPR), Alexandra Navrotsky will also participate in the Lecture Program for the 1992-1993 year.

Cambria Denison was selected for the 1993 Mineralogy/Petrology Research Grant. Jan B. Hensen and

Edward M. Stolper were selected for fellowship.

Members in the News

Susan W. Kieffer was awarded the Arthur Day Medal of the Geological Society of America. She was recognized for accomplishments as a superb experimentalist, field observer, theoretician, and teacher.

A. Bhaskara Rao was awarded the José Bonifacio de Andrada E. Silva Prize, the highest honor of the Brazilian Geological Society. Dr. Rao is Head of the Department of Geochemistry and Mineral Resources of the University of Brasilia. The Prize honors professionals in the geosciences who contribute to the advancement of geology and work towards the furthering of interests of the geoscience community and the Brazilian society.

Marc L. Wilson has been named collection manager and head of the Section of Minerals at The Carnegie Museum of Natural History in Pittsburgh, Pennsylvania.

From the President

"It is the best of times; it is the worst of times;" such is always the case when the rate of evolution borders on revolution. In the world, with the end of the cold war, the emergence of the Pacific rim as an economic force, the new European Economic Community, and a three-candidate presidential election in the U.S., the winds of change are at least gale-force. In American science, the social compact between research and society is being scrutinized at many levels, industrial, academic, government lab, and funding agency. In Earth Sciences our economic base and the jobs our graduate students get are impacted by the shift in emphasis from exploration and exploitation of mineral and petroleum resources to resource management, pollution control, and environmental cleanup. Many universities are revising geology curricula that had remained fairly static for the last thirty years. These revisions tend toward a broader base in earth, atmospheric, planetary, and environmental science, and one has seen the coalescence and realignment of a number of academic departments. Such curricular changes have often diminished the central role of crystallography, petrology, and optical mineralogy in the undergraduate curriculum, seeking instead to integrate the essence, but not the detailed skills, of these disciplines into courses of interest to a wider community, which increasingly includes, not just geologists, but students who will become materials scientists, environmental scientists, and biomedical professionals.

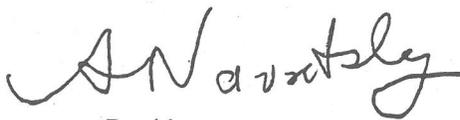
How does this tempest of change affect MSA and what should we be doing to assure our health and vitality, in terms of intellectual excitement, membership, and financial stability, for the years to come? This is, to me, the crucial question for the Society. Our membership, especially students, has been declining. My year as vice president has flown by: I am keenly aware that my year as president will pass rapidly. I have set one major goal for my presidency: to initiate a discussion, at all levels of the Society, of the intellectual basis and directions for its

future. Such considerations will bear fruit over a longer time span than a one-year term of office, and our present vice president, Bernard Evans, will continue and perhaps conclude this inquiry. Should we try to grow or are we the right size? Should we seek closer relations with other societies? What should be our role in interdisciplinary areas - mineralogy and materials science, mineralogy and environmental science, mineralogy and biological science, industrial mineralogy? How should these possible areas influence what we publish in the *American Mineralogist*, what short courses we hold, and in which meetings we participate? How will the more classically defined areas fare in the future - will they dwindle or find new life in different applications?

There has been much discussion of Society finances, of cost cutting measures, of better organization. During the next year we must seek and appoint new editor(s) for the *American Mineralogist*, since Steve Bohlen and Don Peacor have resigned effective Fall 1993. All such decisions need to be approached, not just from a practical point of view, but with an articulated notion of the Society's directions on a 5-20 year scale. Such goals for the future must consider not just the center of gravity of interests of Society members at present, but how this is likely to change, and from what other constituencies we might want to attract new members.

We are appointing an *ad hoc* committee (to be announced in the next *Lattice*) to focus discussions of the Society's future directions. Meantime, do not hesitate to write me your thoughts. We will use *The Lattice* and the AGU and GSA meetings as forums for discussion. MSA needs your input and active participation.

Alexandra Navrotsky



President



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: the *American Mineralogist*, published bi-monthly; 30% 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 1993 are \$55 for professional members; \$30 for students. Membership is on a calendar year basis. Individuals who join after January 1, 1993 will be sent all back issues of the journal for volume 78, 1993.

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 1993 volume of the *American Mineralogist* for the annual rate of \$225 in the US, \$230 in Canada and Mexico and \$235 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.

1993 President: Alexandra Navrotsky
Princeton University

Past-President: Michael J. Holdaway
Southern Methodist University

Vice President: Bernard W. Evans
University of Washington

Secretary: Stephen J. Guggenheim
University of Illinois

Treasurer: Rosalind Helz
U.S. Geological Survey

Editor of *The Lattice*: Marta Flohr
USGS, 959 National Center
Reston, VA 22092

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FAX: (202) 775-0018

International Congress on Applied Mineralogy (ICAM)

May 30 - June 4, 1993
Perth, Western Australia
Call for Papers

The upcoming triennial meeting of the ICAM to be held in Perth, Western Australia, sponsored by the International Council for Applied Mineralogy, the International Mineralogical Association Commission on Applied Mineralogy, and the Australasian Institute for Mining and Metallurgy, is the fifth cross-disciplinary scientific meeting highlighting the uses of mineralogy in many sciences.

Symposium range from Exploration and Mineral Processing to Waste Disposal and Health Issues. Outline abstracts are requested as soon as possible and full abstracts (for publication) *must be received by February 21, 1993 by Brendon Griffin, Centre for Microscopy and Microanalysis, Univ. of W.A. Nedlands, 6009, W. Australia. FAX 61-9-380-1087.*

H.C.W. Skinner (Yale University, Dept. of Geology, Box 6666, New Haven, CT 06511, FAX 203-432-9819) organizer of the symposium "Minerals and Disease" can be contacted for information on that topic.

For details on the pre- and post-congress tours and other information, contact The Congress Secretariat XVIII IMPC, AusIMM, Box 122, Parkville, Vic. 3025, Australia.

Smithsonian Institution Fellowship and Internship Programs

The Smithsonian Institution's Fellowship and Internship Programs for Research in 1993-1994 have an application deadline of January 15, 1993. Research areas include history of science and technology, and Earth sciences (meteoritics, mineralogy, paleobiology, petrology, planetary geology, sedimentology, and volcanology). The fellowships support independent research in residence at the Smithsonian in association with research staff, and using the institution's resources. Senior postdoctoral fellowships of 3-12 months, pre- and post-doctoral fellowships of 6-12 months, and graduate student fellowships of 10 weeks are awarded. Internships are also available for students to participate in research and museum-related activities for 9-12 week periods during summer, fall, and spring. Undergraduates receive \$250/week and graduate students receive \$300/week; travel allowance may also be provided. For information and application forms write Smithsonian Institution, Office of Fellowships and Grants, 955 L'Enfant Plaza, Suite 7000, Washington, DC 20560.

**THE DEADLINE FOR THE
FEBRUARY ISSUE OF *THE LATTICE*
IS JANUARY 29TH**

Experiments at High Pressures and Applications to the Earth's Mantle

Mineralogical Association of Canada Short Course

Date: May 15-16, 1993 (before GAC-MAC meeting)
Location: University of Alberta, Edmonton, Alberta

Techniques for experimentally simulating the outer ~1000 km of the Earth have evolved over the past several decades. With the refinement of multiple-anvil devices, experiments in mm³-sized volumes at pressures to 25 GPa have become possible. The scientific community in Canada has available a national facility that offers this capability in the C.M. Scarfe Laboratory of Experimental Petrology at the University of Alberta. The USSA-2000 "Superpress" can achieve simultaneously pressures of 27 GPa and temperatures >3000°C. Use by members of the research community external to the University of Alberta is actively encouraged.

A Mineralogical Association of Canada Short Course is scheduled for the 1993 GAC-MAC meeting in Edmonton. This Short Course will focus on experimental studies of the lower crust and upper mantle. The topics will range from "nuts and bolts" of actually doing the experiments, to broader discussions of what we know about the Earth's mantle, what we think we know, and - most importantly - what we do not know.

The audience for the Short Course consists of two groups: (1) researchers and students interested in using the experimental apparatus for their own research, and (2) earth scientists interested in the general field of mantle petrology, evolution, and high-pressure geochemistry who wish to get an overview of current research in the field.

The Short Course will consist of three parts. First, an overview of the apparatus and techniques for high-pressure experimentation will be given, focussing on what is possible to do both in Canada and in collaboration with colleagues in other countries. Second will be a series of talks focussing on both techniques and results of experiments at high pressures, and the application of those results to the Earth. The emphasis will be on the current state of understanding of equilibrium and kinetic processes that are taking place at high pressures and temperatures. The final portion of the Short Course will consist of an afternoon spent "hands-on" in the Superpress lab, where interested participants will assemble and conduct an experiment. This exercise will give perspective users of the facility a better idea of what is involved in multi-anvil experimentation.

Details and registration form: Prof. R.W. Luth
Department of Geology
University of Alberta
Edmonton, Alberta T6G 2E3
Canada
FAX: (403) 492-2030

Registration Form

MSA Short Course

Health Effects of Mineral Dusts October 22-24, 1993

Return this registration form, completed, to the MSA Business Office, 1130 17th Street, N.W., Suite 330, Washington, D.C. 20036. FAX: (202)775-0018. Payment must accompany this form. Registration is limited to 100 individuals on a first-come, first-served basis. Please type or print. All cancellations must be made in writing and received by October 1. No refunds will be made on cancellation notices after this date.

Name _____
(first) (middle initial) (last)

Address _____

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

Telephone numbers _____ (office) _____ (fax)

Please circle the appropriate registration category.

PRICES INCLUDE ALL LODGING AND MEALS

	Member	Non-Member
Professional: in single room	\$625	\$680*
Professional: in double room	\$475	\$530*
Student: in double room	\$300	\$330*

*includes MSA dues for 1993.

Please check method of payment:

____ Enclosed is a check or money order in the amount of \$ _____.
____ Please charge my ____ Visa ____ Mastercard
____ Diner's Club ____ American Express card in the amount of \$ _____.

(Your credit card will be charged when the registration form is received.)

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

(signature) (exp. date)

Please list any special requirements regarding meals.

MSA Short Course

Health Effects of Mineral Dusts

Date: October 22-24, 1993
Location: Harbor House Resort and Conference Center, Nantucket
Conveners: George Guthrie, Los Alamos National Lab
Brooke Mossman, University of Vermont

Although the asbestos minerals (fibrous serpentine and amphibole) are notorious as potential health hazards, several other mineral dusts have also been shown to be toxic, fibrogenic, and carcinogenic. The biochemical reactions that lead to disease occur at the mineral-fluid interface. Hence, a thorough understanding of mineral-induced disease requires an integrated approach that addresses mineralogical and geochemical concerns. We are convening a 2½-day short course that will bring together experts in both the mineralogical and biological communities to discuss current issues in mineral-dust hazards.

Mineralogical topics will cover: (1) natural occurrences and properties of minerals for which toxicological data have been determined, including structures, compositions, microstructures, and surface properties, (2) analytical techniques for characterizing biologically-important properties, and (3) potential geochemical mechanisms.

Biological topics will cover: (1) epidemiology of mineral-induced disease, (2) biological activities of various minerals, as determined by *in vivo* and *in vitro* assays, and (3) biochemical mechanisms.

Both areas will present sufficient introductory material for individuals outside of the discipline.

The scientific aspects of mineral-related regulatory policies will also be discussed.

Two panel discussions are planned to allow active participation between the speakers and audience. Panel discussions will cover policy-related topics and scientific topics, such as directions for future research. A poster session/reception will provide the opportunity for those who attend to present results of relevant current research.

The intended audience for this short course includes bioscientists and geoscientists actively involved in research on the health effects of minerals, individuals involved in formulating policies related to mineral regulation, and any individuals interested in an introduction to this topic.

See Short Course registration form on page 4. For more information, contact George Guthrie at (505) 665-6340.

Lehigh SEM and AEM Short Courses

Lehigh University is sponsoring several short courses that deal with various aspects of scanning electron microscopy and analytical electron microscopy.

Basic Course: *Scanning Electron Microscopy and X-ray Microanalysis* (June 14-18, 1993). A basic course directed toward academic, industrial, and government scientists, engineers, biologists, technicians, and technical managers whose activities and interests relate to SEM and x-ray microanalysis. The course has two options: Materials and Biology/Polymers. Seven SEM's, one automated electron microprobe, and various EDS/WDS instruments will be available for the labs and hands-on use. A textbook is provided.

Advanced Courses (June 21-25, 1993):

1. *Microcharacterization of Electronic Materials, Devices, and Packages*. This course covers the physical principles and practical aspects of the following: voltage contrast, low voltage microscopy, charge collection microscopy, cathodoluminescence, scanning tunneling microscopy, confocal optical microscopy, and surface analysis.
2. *Advanced Scanning Imaging*. This course is directed towards SEM users who wish to obtain the highest possible resolution from their SEM. Topics: high resolution SEM, advanced coating techniques, low-voltage microscopy, environmental SEM, computer-aided imaging, framestore real time digital imaging, quantitative stereo, scanning tunneling, and atomic force microscopy.
3. *Quantitative X-ray Microanalysis of Bulk Specimens and Particles*. SEM or microprobe operators and supervisors who wish to advance their knowledge of x-ray microanalysis will find this course of interest. Topics: x-ray production; ZAF calculations using PC's; WDS/EDS detectors; quantitative analysis of particles and rough specimens, computer-aided imaging, error analysis and statistics, strategy for applying microanalysis techniques, and light element analysis.
4. *AFM, STM, and Other Scanned Probe Microscopies*. This course will cover the physical properties and practical aspects of: scanning tunneling microscopy, atomic force microscopy, scanning tunneling spectroscopy, scanning tunneling potentiometry, feedback control, tip fabrication, scan calibrations, in-situ imaging, UHV imaging, imaging in air, image processing, near field optical probes, surface science applications, metrology, engineering applications, lateral force microscopy, electrochemical STM/AFM, and other emerging scanned probe techniques.

Other courses: *Analytical Electron Microscopy* (June 21-24, 1993). This course covers the analytical techniques available on modern TEM/STEM and dedicated STEM instruments. *Thin Specimen Preparation* (June 24-25, 1993). This course is directed toward all AEM and TEM users who want to learn the latest techniques of thin specimen preparation.

Details: Professor Joseph I. Goldstein, Dept. Materials Science and Engineering, 5 E. Packer Ave., Lehigh University, Bethlehem, PA 18015. Telephone: 215-758-5133; FAX: 215-758-4244.

MEETING CALENDAR 1992-1994

1992

December

7-11 **AGU Fall Meeting**, San Francisco, CA. *Details:* AGU Meetings Dept. Telephone: (202) 462-6910.

14-16 **Mineralogical Society of Great Britain Winter Meeting on Mineralogical Applications of Surface Science** and short course, to be held at the University of Manchester. *Details:* Prof. D.J. Vaughan, Dept. of Geology, University of Manchester, Manchester M13 9PL Great Britain. Telephone: 061-275-3895; Fax: 061-275-3947.

1993

February

13 **14th Mineralogical Symposium** (topic: garnet). *Details:* Dr. Karen Wenrich, U.S. Geological Survey, MS 939, Federal Center, Denver, CO 80225. Telephone: (303) 236-1563.

April

1-2 **"Rare Earth Minerals: Chemistry, Origin, and Ore Deposits"** in London, UK. *Details:* Ms. Frances Wall, Dept. of Mineralogy, The Natural History Museum, Cromwell Road, London SW7 5BD, UK. Fax: 4471 938 9268.

12-16 **Annual Spring Meeting of the Materials Research Society**, San Francisco, CA. *Details:* Materials Research Society, Meetings Dept., 9800 McKnight Road, Pittsburgh, PA 15237 USA. Telephone: (412) 367-3003; Fax: (412) 367-4373.

May

17-19 **Joint meeting of the Geological Association of Canada and the Mineralogical Association of Canada**, Edmonton, Alberta. *Details:* J.W. Kramers, Alberta Geological Survey, P.O. Box 8330, Station F, Edmonton, Alberta T6H 5X2, Canada. Telephone: (403) 438-7644; Fax: (403) 438-3364.

24-28 **Joint AGU/MSA Spring Meeting**, Baltimore, MD.

May-June

31-4 **ICAM'93 - "Mineralogy in the Service of Man."** Applied Mineralogy Conference in Perth, Western Australia (dates include workshops). *Details:* Jim Graham, Division of Mineral Products, CSIRO, Private Bag, P.O. Wembley, 6014, Western Australia. Telephone: 61 9 387 0371; Fax: 61 9 387 8642.

June-July

29-10 **NATO Advanced Study Institute - Feldspars and their reactions**, Edinburgh, UK. *Details:* Ian Parsons, Dept. Geology and Geophysics, The University of Edinburgh, Edinburgh, EH9 3JW, UK. Fax: 44 31 668 3184.

July

5-16 **IGCP Project 294 thematic meeting Very low grade metamorphism: Mechanisms and geologic applications** in Xi'an, China, plus related field excursions to the Erdos Basin and the North Qilian Mountains. *Convener:* Dr. Wu Hanquan, Xi'an Institute of Geology and Mineral Resources, 116 Easy Youyi Road, Xi'an 710054, P.R. China.

18-23 **10th International Clay Conference - "Clays Control the Environment"** at the University of Adelaide, Australia. *Details:* Conference Secretariat, Ellisservice Convention Management, P.O. Box 753, Norwood SA 5067, Australia. Telephone: 61 8 332 4068; Fax: 61 8 364 1968.

September

8-17 **Symposium on Layering in Igneous Complexes**, Johannesburg, South Africa. *Details:* Prof. R. Grant Cawthorn, Dept. Geology, University of the Witwatersrand, Private Bag 3, PO Wits 2050, Republic of South Africa. Telephone: 011 716 2711 or 011 716 2608; Fax: 011 339 1697 or 011 403 1926.
(Meeting Calendar continued on next page)

National Research Council Postdoctoral Fellowships

The National Research Council plans to award approximately 25 Ford Foundation Postdoctoral Fellowships for Minorities in a program designed to provide opportunities for continued education and experience in research for Native American Indians, Alaskan Natives (Eskimo or Aleut), Black/African Americans, Mexican Americans/Chicanos, Native Pacific Islanders (Micronesians or Polynesians), and Puerto Ricans. Awards will be made in the behavioral and social sciences, humanities, engineering, mathematics, physical sciences, and biological sciences, or for interdisciplinary programs composed of two or more eligible disciplines.

Deadline: January 8, 1993.

Details:

Fellowship Office, GR420A
National Research Council
2101 Constitution Ave.
Washington, DC 20418

IN MEMORIAM

We regret to announce the passing of the following MSA fellows and members. The Society extends its condolences to the family and friends of these scientists.

Henderson, Edward P.
Life Fellow, 1923

Mikami, Harry, M.
Life Fellow, 1947

Wishart, James S.
Life Member, 1935

Meeting Calendar (continued)

September

25-30 Annual Meeting of the Clay Minerals Society in San Diego, CA. *Details:* Dr. Richard W. Berry, Dept. of Geological Sciences, San Diego, CA 92182. Telephone: (619) 594-6394, Fax: (619) 594-4372.

November

15-30 IGCP Project 294 thematic meeting **Low temperature metamorphism: Processes, products, and economic significance**, Santiago, Chile. *Convener:* Professor M. Vergara, Universidad de Chile, Department de Geologia y Geofisica, Casilla 13518-Correo 21, Santiago, Chile. Fax: 56 2 6963050.

1994

April

13-15 **EMPG-V - "Fifth International Symposium of Experimental Mineralogy, Petrology, and Geochemistry."** *Details:* Dr. R.J. Angel, Dept. Geological Sciences, University College London, Gower St., London, WC1E 6BT, England. Telephone: +44-71-387-7050, Fax: +44-71-388-7614.

WELCOME!

The following new members and students have joined MSA effective January 1, 1992. Welcome! Applications for membership may be obtained from the MSA Business Office, 1130 Seventeenth Street, N.W., Suite 330, Washington, DC 20036.

Anderson, Orson L., IGPP, UCLA, Room 4851, Slichter Hall, Los Angeles, CA 90024-1567. O:(310) 825-2386. F:(310) 206-3051. (M-92)MI. Sponsors: Alexandra Navrotsky and Wayne A. Dollase.

Choi, Seon-Gyu, Korea University, Dept Geology, #1 Anam-Dong, Seongbukku, Seoul, 136-701 Korea. O:(02) 920-1493. F:(02) 927-6180. (M-92)GE. Sponsor: MSA.

Daniel, Christopher, Dept of Geology, Univ of New Mexico, Albuquerque, NM 87131. O:(505) 277-2325. (ST-92)MP. Sponsor: MSA.

Dombrowski, Tom, 101 Wood Ave, South, Engelhard Research Center, Iselin, NJ 08830. O:(908) 205-6839. (M-92)CM. Sponsors: F.M. Allen and M.M. Hamil.

Furukawa, Yoko, Dept of Geosciences, Deike Bldg, Penn State University, University Park, PA 16802. O:(814) 865-3565. F:(814) 863-2001. (ST-92)GE. Sponsors: H.L. Barnes and Deane K. Smith.

Gillmeister, Norman, Bloomsburg University, Bloomsburg, PA 17815. O:(717) 389-4746. (M-92)MP. Sponsor: MSA.

Hanchar, John M., RPI, Dept of Earth and Environmental Sciences, Troy, NY 12180. O:(518) 276-8827. F:(518) 276-8627. (ST-92)GE. Sponsors: Daniel J. Cherniak and E. Bruce Watson.

Kollmuss, Stefan, Hauptstr. 78, Herdecke, Germany D-5804. O:(02330) 12810. (ST-92)CC. Sponsors: Hermann Gies and Olaf Medenbach.

Kueck, Holger, Heitkampsfeld 9, 4690 Herne 2, Germany. O:(02325) 573325. (ST-92)MP. Sponsors: Hans-Peter Schertl and W. Schreyer.

Lafemina, John Peter, Molecular Sci Research Center, Battelle Boulevard, Richland, WA 99352. O:(509) 375-6895. F:(509) 375-6916. (M-92)GE. Sponsors: Anthony C. Hess and David M. Sherman.

Liu, Ping, Dept of Geology, Stanford University, Stanford, CA 94305-2115. O:(415) 723-4092. F:(415) 725-2199. (ST-92)GE. Sponsors: Gordon E. Brown, Jr. and Glenn A. Waychunas.

Moshoian, Andrew D., Dept of Geology & Geophysics, UC - Berkeley, Berkeley, CA 94720. O:(510) 653-2142. (ST-92)IP. Sponsor: MSA.

Nishi, Fumito, Agata 209-3, Chiisagata-Gun, Tobu-Machi, Nagano-Ken, Japan 389-05. O:(0268) 64 4646. (M-92)MI. Sponsor: Yoshio Takeuchi.

Pattison, David R.M., Dept of Geology & Geophysics, Univ of Calgary, Calgary, AB, Canada T2N 1N4. O:(403) 220-3263. F:(403) 284-0074. (M-92)MP. Sponsors: Terence M. Gordon and Mavis Z. Stout.

Powers, Karen E., Dept of Geology, Univ of Florida, 1112 Turlington Hall, Gainesville, FL 32611. O:(904) 392-2231. (ST-92)MI. Sponsors: Frank N. Blanchard and Linda L. Horn.

Siegmann, Silvester, Blumenstr. 52, Bochum, Germany D-4630. O:(0234) 581436. (ST-92)CC. Sponsors: Hermann Gies and Olaf Medenbach.

Verheul, Maarten M., Makassarstraat 11-BIS, Utrecht, The Netherlands 3531 VJ. (ST-92)MP. Sponsors: T.G. Nijland and C.F. Woensdregt.

Vortmann, Silke, Vogtei 5, Essen 16, Germany W-4300. (ST-92)CC. Sponsors: Hermann Gies and Olaf Medenbach.

Vrdoljak, Gordon Ante, 366 Prince of Wales Drive, Whitby, Ontario, Canada L1N 6M9. O:(416) 978-0668. F:(416) 978-3938. (ST-92)GE. Sponsors: John Rucklidge and Grant S. Henderson.

IMA Membership

The International Mineralogical Association (IMA) now accepts individual memberships. The annual membership dues, to be paid in advance, will be \$10 (US) or \$40 (US) for five years. The following application, with payment, should be returned to: **Stefan S. Hafner, University of Marburg, Institute of Mineralogy, Hans-Meerwein-Strasse, 3550 Marburg, Germany.**

International Mineralogical Association -- *Application for Personal Membership*

Name:

Address:

Telephone number:

Telex, Earn/Bitnet, Telefax numbers, if available:

Degrees (with dates):

Present position or occupation:

Fields of major interest:

I am enclosing a check or money order (you may also send cash, at your own risk).

Please check below:

for membership of five years (US \$40)

for membership of one year (US \$10)

Donation _____

Total _____

(Date)

(Signature)



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