
Minnesota Microscopy Society

Local affiliate of the *Microscopy Society of America*
and the *Microbeam Analysis Society*



Newsletter

September 2001

MMS September Meeting

Thursday, September 20, 2001

Causes of Color in Minerals and Gemstones

Speaker:

Paul F. Hlava
Sandia National Laboratories
Dept. 1822, Mail Stop 0886
Albuquerque, NM 87185-0886

Since 1974, Paul Hlava has worked in the electron microprobe laboratory at Sandia National Laboratory; that same year he graduated from the University of New Mexico with a Masters Degree in Geology. Paul stays active in the areas of geology, mineralogy, crystallography, and gemology. He is President of the Albuquerque Gem and Mineral Club, and often gives talks on geological/mineralogical/crystallographic subjects. Paul is a director of the Microbeam Analysis Society (MAS), coordinates the MAS Tour Speaker Program, and is himself a MAS tour speaker.

Abstract: The colors that one sees when looking at a mineral or gemstone are due to the response of that person's eye to the energies of the light, the emission spectrum of the illumination, and, most importantly, physical phenomena in the material that cause some colors to be absorbed while others are undisturbed or enhanced. This talk will focus on the various ways in which materials, especially minerals and their degree of perfection, produce color from white light.

Light is a form of energy (electromagnetic energy) and white light is a mixture of all of the visible energies (or wavelengths). In order for a mineral to cause color from white light, it has to somehow change the balance of the light energies. There are at least 15 mechanisms by which this can occur.

(Abstract continues on page 2)

Meeting Location:

Earle Brown Continuing Education Center
University of Minnesota
1890 Buford Avenue
St. Paul, MN 55108-6092
(see location map on page 2)

Schedule of Events:

5:30 - 6:00 PM **Social Hour: Wine and Cheese**
6:00 - 7:00 PM **Dinner**
7:00 - 7:15 PM **Business Meeting**
7:15 - 8:30 PM **Speaker**

Dinner:

Dinner will be at the Earle Brown Center and will include roast turkey, mashed potatoes, green beans, almandine, salad, rolls, and chocolate mousse. The cost of the meeting including the dinner, wine and cheese will be \$20.00 for members, and \$5.00 for students.

To make reservations, contact Peter McSwiggen at 612-624-7370 or mcswi001@umn.edu by **Monday, September 17, 2001**.

Abstract (continued from page 1)

While there are some color mechanisms that depend on direct emission of certain colors, most of the mechanisms we are interested in depend on the ability of minerals to preferentially absorb certain energies of light. When these energies are removed from the white light the mineral is colored by the complimentary colors.

Light absorption by the electrons of transition metal (or rare earth element - REE) atoms, either as major portions of the mineral chemistry or impurities, is one of the most important and well known of the coloring mechanisms. Most common rock-forming elements have electronic structures which mitigate against causing colors. On the other hand, transition metals (and REE's) have electrons which can be excited to open, higher energy levels. The electrons gain the necessary energy for the excitation by absorbing a particular energy (color) from white light and thus cause the mineral to show the complimentary color. Three prime examples of this mechanism are rubies, emeralds, and alexandrites, but there are many others.

Upcoming Meetings

October 11-12

Workshop: Electron Backscatter Diffraction (EBSD)

The University of Minnesota, through the IT Characterization Facility and the Minnesota Microscopy Society, presents a Master class workshop on EBSD. This workshop is intended to provide a basic outline of the principles and applications of electron backscatter diffraction to material science. This rapidly developing technique allows crystallographic information to be obtained from samples in the scanning electron microscope (SEM). This data can be combined with chemical information to provide accurate phase identification from sub-micron sized particles, or may be used on its own to provide a material texture analysis.

The course will be directed towards materials scientists, advanced technicians and technical managers who are required to use or interpret data obtained from the SEM.

The 2-day course will be divided into morning lecture sessions and afternoon hands-on learning opportunities. The lectures will cover the basic techniques as well as applications to specific materials science problems. The tentative outline includes the following topics:

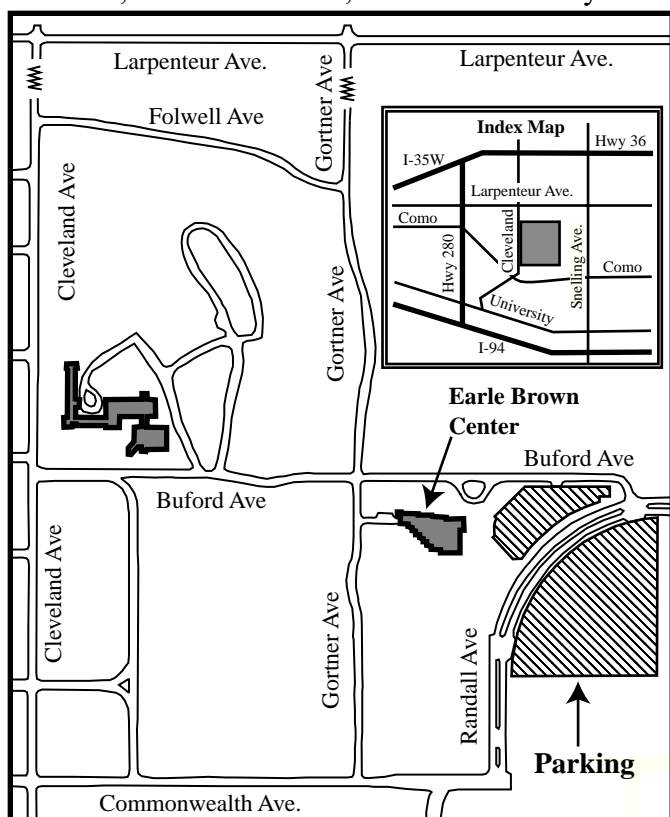
- > Introduction to EBSD
- > Specimen Preparation
- > Phase Identification
- > Phase Discrimination
- > Texture Mapping
- > Texture Measurement
- > Image Processing
- > Data Analysis

Instructors:

- > Pat Camus (Noran)
- > Keith Dicks (Oxford Instruments)
- > Jeff Farrer / Matthew Nowell (TSL EDAX)
- > John Stliff (HKL)

Registration:

Enrollment is limited, so act early. To register for the workshop, contact the Characterization Facility's main office: Phone (612-626-7594), Fax (612-525-5368), or e-mail: charfac@umn.edu



Location Map for the Earle Brown Center on the St. Paul Campus of the University of Minnesota.

Upcoming Meetings - Continued

November 8 - Thursday

Tour of Medtronic's Corporate Research Center / Microscopy Lab and

Talk: Chemical Imaging

Speaker: Dr. Patrick Treado of ChemIcon

Location: Medtronic Corporate Headquarters
710 Medtronic Parkway, Fridley
(Hwy 694 and Central Ave.)

Medtronic Inc. has a new world headquarters and corporate research facility. The research labs include metallurgical, wet chemical and microscopy. Our tour of the facilities will be followed by dinner and a talk on Raman microscopy and chemical imaging.

Program: Arrive around 5:15 PM

5:30 - 6:30 PM Tour

6:30 - 7:30 PM Dinner

7:30 - 8:30 PM Speaker

February 7 - Thursday

Speaker: Karen Runon
Minneapolis Police Department
Forgery Unit

March 27 - Wednesday

MMS Joint Meeting with ASM

Speaker: George Vander Voort
Beuhler Ltd.

Location: Sheraton Four Points
(on 35W, north of downtown Mpls.)

April Meeting

Tour of the Mayo Clinic Joint meeting with the Iowa Microscopy Society

Suggested Afternoon Program:

- > Tour of Mayo Clinic
- > Talk by Ken Moore, Iowa
Stem Cell Research and Gene Therapy
- > Social Hour
- > Dinner
- > After dinner speaker

May 3 - Friday

MMS Spring Symposium

Topic: Nanotechnology

Location: Science Museum of Minnesota

Again this year the Minnesota Microscopy Society will be putting on a full day of talks for our Spring Symposium. The focus will be on the dynamic new world of nanotechnology. We hope to have a wide range of speakers. If you know of somebody you would like to hear, or would be interesting to others, let us know.

Microscopy Community News

MSA Technologists' Forum

The Technologists' Forum is a special interest group within MSA that acts as a channel for the personal growth and development of technologists. The Forum organizes a special topic presentation, a symposium, a roundtable discussion and an exhibit booth at the annual Microscopy and Microanalysis meeting. A semiannual electronic newsletter, published by the Forum, increases contact among its members and expands their participation in and contributions to MSA. The Forum also sponsors the Professional Technical Staff Awards, which is a competitive program to encourage participation of technologists at the annual meeting. Any MSA member is welcome to join the Technologists' Forum and contribute to its activities. For more information, please contact Technologists' Forum Chair Jeanette Killius at 330/325-6311, by e-mail at jkillius@neoucom.edu, or visit our web pages through the MSA web site at www.msa.microscopy.com.

New MMS Web Site

The Minnesota Microscopy Society has a new web site. It is now "**www.MNmicroscopy.org**". The actual physical location of the web site has not changed. It is still being maintained on one of the computers at the IT Characterization Facility at the University of Minnesota. However, the name will now be easier to remember when surfing the net to look for the latest MMS Newsletter.

MSA Professional Technical Staff Awards

The Professional Technical Staff Awards (PTSA) were created to stimulate attendance at the MSA annual meeting for professional technical staff who ordinarily might not participate in a national meeting, and to encourage employers to support their staff in professional activities. There will be up to four awards given based on the quality of a first-authored paper submitted for presentation at the meeting. The awards consist of free full registration for the meeting, including a copy of the *Proceedings* and attendance at the Sunday evening social event. MSA will reimburse awardees up to \$600 for travel, lodging and other expenses. Applicants must be paid-up members of MSA at the time of application. Abstracts will be judged by the MSA Technologists' Forum. Successful applicants must present their papers personally at Microscopy and Microanalysis 2002 in order to receive an award. They are expected to attend and participate in the entire meeting. Former winners will not be eligible for another award. Complete details about the application process, including application deadline, will be available in the *Registration Bulletin and Call for Papers* for Microscopy and Microanalysis 2002, which will be sent to MSA members in November, 2001. For further information, contact the Chair of the Technologists' Forum: Ms. Jeanette Killius at 330/325-6311 or by e-mail at jkillius@neoucom.edu.

Microscopy Society of America Undergraduate Research Scholarship Program

This is the 13th year of the MSA Undergraduate Research Scholarship Program. To date, over 65 projects, covering a wide range of topics in the physical and biological sciences, have received support through this program.

The program is funded by MSA, and is able to support approximately 30% - 40% of applicants. The maximum award from MSA is currently \$3,000 and helps to provide student stipends, supply costs, and limited travel expenses associated with the research. Additional support in the form of instrument use time, equipment purchases, etc. is generally provided by the student's supervisor and/or through the sponsoring institution. Abstracts reporting the research results, are prepared by scholarship awardees and published in "Microscopy and Microanalysis." The program actively seeks external sources of matching funds in order to maintain the favorable levels of support both in terms of the numbers of projects supported and the level of support for each.

The MSA Undergraduate Research Scholarship Program is currently soliciting applications from students interested in conducting a research project which involves the use of any microscopy technique. Students must be sponsored by a member of MSA. The application deadline is December 21, 2001. Applications can be obtained from the MSA Business Office, businessoffice@msa.microscopy.com, or call 1-800-538-3672.

For further information contact either:

Dr. Ralph Albrecht
University of Wisconsin
1656 Linden Drive, Madison, WI 53706
608-263-3952 or 608-263-4162
albrecht@ahabs.wisc.edu

or

Dr. Richard Ornberg
Monsanto Company
Analytical Sciences Center
800 N. Lindbergh Blvd.
St. Louis, MO 63167
314-694-1184
rlornb@ccmail.monsanto.com

Get Your News in this Space

The Minnesota Microscopy Society is looking for contributions to its newsletter. These contributions can be either news items or short articles on a technical topic that would be of general interest to the Society's members. Does your company have a new product or a new sales representative for this area? If you have news that would be of interest to MMS members, send it to the Newsletter Editor, Peter McSwiggen, University of Minnesota, Department of Geology & Geophysics, 310 Pillsbury Drive SE, Minneapolis, MN 55455, or e-mail it to: mcswi001@umn.edu

Sustaining Corporate Members

Sustaining members are the backbone of financial support for the Society. These members make it possible for the Society to support Project Micro and to cover many expenses of the regular meetings and the Spring Symposium. We greatly appreciate the continued support of these individuals and corporations. To become a Sustaining Member, complete and return the MMS membership form at the end of the newsletter.

Randy Beaubien	FEI Company	513-474-4168
Peter Braverman	Cadmet Inc.	800-543-7282
Alex Butzer	North Central Instruments, Inc.	612-559-3008
John Crowe	Denton Vacuum Inc.	609-439-9100
Andrew Davis	Cameca Instruments Inc.	203-459-0623
Lester Engel	Engel Metallurgical Ltd.	320-253-7968
Robert Evans	Ted Pella, Inc.	800-237-3526
Larry Glassman	G. W. Electronics, Inc.	770-449-0707
Greg Halvorson	Solution Partners	612-931-0811
Larry Hanke	Materials Evaluation & Engineering Inc.	612-449-8870
Gary Hawkinson	NORAN Instruments	608-244-7812
John Humenansky	Physical Electronics	952-828-6387
Stacie Kirsch	Electron Microscopy Sciences	800-523-5874
Betsy Larwa	Mager Scientific, Inc.	800-521-8768
Robert Mierzwa	JEOL	920-803-8945
Curt Morrison	Leeds Precision Instruments	612-546-8575
Ruth Murray	Oxford Instruments USA	606-384-9861
Cathy Ryan	Micro Star Technologies	409-291-6891
Gary Saxrud	Fryer Company, Inc.	612-942-6747
Jean Schlosser	Crane Engineering and Forensic Services	612-557-9090
Steven Slap	Energy Beam Sciences, Inc.	413-786-9322
Gary Smith	Katz Analytical Services	612-361-5570
Mary Sullivan	Scanning / FAMS, Inc.	201-818-1010
Gene Taylor	M. E. Taylor Engineering, Inc.	301-774-6246
Roger Teppert	Hitachi Scientific Instruments	847-966-2980
Callie Thomas	Tousimis Research Corp.	301-881-2450
John Treadgold	LEO Electron Microscopy Inc.	847-290-9566
Steve Ziegler	Digital Instruments	512-912-1615

If any Sustaining Members are missing from this list, *please* contact either: Diana Kittleson (651-917-5859, dkittleson@pillsbury.com) or Peter McSwiggen (612- 624-7370, mcswi001@umn.edu)

MMS Patron Members

The Minnesota Microscopy Society would like to express our thanks to our Patron Members. These members provide financial support to the organization above the standard membership fee. This type of continued support makes it possible for MMS to maintain its financial well being. To become a Patron Member, complete and return the MMS membership form at the end of the newsletter.

Ronald Adkins, 3M Company, St. Paul, MN
Gib Ahlstrand, Plant Pathology, U of M
Michael Coscio, Medtronic Inc., Brooklyn Center
Kevin Cowden, Medtronic Inc., Brooklyn Center
Stan Erlandsen, Cell Biol. & Neuroanatomy, U of M
Chris Frethem, Cell Biol. & Neuroanatomy, U of M
Kathryn Hanna, College of Biol. Science, U of M
Mike Herron, Medicine, University of Minnesota
Dave Lindman, Minneapolis Police Crime Lab
Susan Okerstrom, Medtronic Inc., Brooklyn Center

Ev Osten, 3M Company, St. Paul, MN
Ann Palmer, Entomology, U of M
Jeff Payne, 3M Company, St. Paul, MN
Patricia Schachern, Otolaryngology, U of M
Dan Schaub, Philips Electron Optics, Inc., Oronoco
Carolyn Sutherland, Otolaryngology, U of M
Jerry Tangen, JEOL USA, Inc., Monticello, MN
Greg Trettel, BF Goodrich Aircraft Sensors, MN
Rae Vigeant, Random Microscopy Services, St. Paul

MMS BOARD and OFFICERS 2001-2002

President: Peter McSwiggen, University of Minnesota, Dept. of Geology & Geophysics, Minneapolis, MN 55455; (612) 624-7370, mcswi001@umn.edu

Newsletter Editor: Peter McSwiggen, University of Minnesota, Dept. of Geology & Geophysics, Minneapolis, MN 55455; (612) 624-7370, mcswi001@umn.edu

Past-President: Jean Schlosser, Crane Engineering and Forensic Services, 3905 Annapolis Lane N., Plymouth, MN 55447, (763) 557-9090, Fax (763) 557-0710, tcrane@skypoint.com

Copy Editing: Barbara Meier

MAS Representative: Michael Coscio, Medtronic Inc., 710 Medtronic Parkway, Minneapolis, MN 55432-5604 (763) 505-4561; mike.coscio@medtronic.com

President-Elect: Mary Swierczek, 3M Center, Bldg. 201-BE-16, St. Paul, MN 55144; (651) 736-5087, Fax (651) 733-0648, mjswierczek@mmm.com

Other Board Members:

Ev Osten, 3M Center, Bldg. 201-1E-16, St. Paul, MN 55144; (651) 736-0104, efosten@mmm.com

Secretary: Mary Swierczek, 3M Center, Bldg. 201-BE-16, St. Paul, MN 55144; (651) 736-5087, Fax (651) 733-0648, mjswierczek@mmm.com

Jeff Payne, 3M Center, Bldg. 201-1E-16, St. Paul, MN 55144; (651) 733-2352, jjpayne@mmm.com

Treasurer: Dwight Erickson, 3M Center, Bldg. 251-1A-03, St. Paul, MN, 55144; (651) 736-2830, Fax (651) 736-7496, usmmm214@ibmmail.com

Sue Okerstrom, Medtronic Inc., 7000 Central Ave. NE., Minneapolis MN 55432; (763) 514-4678, sue.okerstrom@medtronic.com

Corporate Liaison: Diana Kittleson, Pillsbury Technology East, 737 Pelham Blvd., St. Paul, MN, (651) 917-5859, dkittleson@pillsbury.com

Paul Baker, Medtronic Inc. 7000 Central Ave. NE., Minneapolis MN 55432; (763) 514-4519, paul.baker@medtronic.com

Webmaster: Stuart McKernan, IT Characterization Facility, University of Minnesota, Minneapolis, MN, 55455; (612) 624-6009, FAX (612) 626-7530, stuartm@umn.edu

Ann Palmer
ann.t.palmer-1@umn.edu

Your MMS Annual Membership fee is due in September/October!

All microscopists are urged to support their Society at one of the membership levels offered below. The more dues-paying members we have, the more likely we are to attract sustaining corporate memberships which form the financial backbone of our Society. Often, supervisors will support MMS memberships out of their project budget because they recognize that it is a very inexpensive way to maintain and increase the skills of their microscopists. If you have been a member over the years and recognize the value of MMS to the community of microscopists it serves, consider upgrading your membership this year to the patron or sustaining level. Thank you.

Name _____ Dr _____ Mr _____ Ms _____ Phone (____) _____

Affiliation _____ Position _____

Address _____ ZIP _____

Indicate the method by which you would like to receive the Newsletter: mail _____ e-mail/web _____ both _____

E-mail address _____

Check here _____ if you do NOT want your name and address to appear in the Society directory.

Area of interest: Bioscience _____ Materials Science _____ SEM _____ TEM _____ X-ray _____

Membership level: Basic \$10 _____ Patron \geq \$25 _____ Corporate Sustaining \$100 _____ Student \$5 _____

Make checks payable to MMS and mail to our treasurer:

Dwight Erickson, MMS Treasurer, 3M Center, Bldg. 251-1A-03, Saint Paul, MN 55144-1000.

Minnesota Microscopy Society
Peter McSwiggen, MMS Editor
University of Minnesota
310 Pillsbury Drive, SE,
Minneapolis, MN 55455

September 20, 2001:

Causes of Color in Minerals and Gemstones

Forwarding and Address
Correction Requested