

# **Bulletin of the Mineralogical Society of Southern California**



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The 854th Meeting of the Mineralogical Society  
of Southern California

**Lasers in Geology:  
Destructive and Non-Destructive Testing  
Of  
Rocks and Minerals.**

**By**

**Megan Shadrick**

**Friday, May 8, 2009 at 7:30 p.m.**

**Geology Department, E-Building, Room 220  
Pasadena City College  
1570 E. Colorado Blvd., Pasadena**

## **Featuring:**

- Minute of April meeting
- Celestron handheld digital microscope
- The John Sinkankas Spinel Symposium
- What's new at Lancaster

**May Program**  
**Date: May 8,2009**  
**Same time Same place**

**Lasers in Geology:**  
**A Two Part Analysis in Destructive and Non Destructive**  
**Testing of Rocks and Minerals**

By Bruce Carter

Our speaker for the month of May is Megan Shadrick.  
Her information is as follows:

Lasers in Geology: A Two Part Analysis in Destructive and Non-Destructive Testing of Rocks and Minerals. Megan Shadrick California State University, San Bernardino. Presentation: 8 May 2009 Mineralogical Society of Southern California.

LASER technology (Light Amplification by Stimulated Emission of Radiation) has captured the imagination of our modern society. Lasers are found everywhere from grocery stores and night clubs to advanced medical and scientific research centers. In the geological sciences, lasers are utilized for both destructive and non-destructive uses, such as well bore drilling and spectroscopy. Non-destructive scientific lasers utilize the optical properties of coherent, monochromatic light to measure various properties of a rock or mineral, such as the composition or temperature.

Destructive applications of lasers require a high power laser to remove portions of rock or mineral without damage to the surrounding material. This technology is being used to repair or create art sculptures and complete drilling operations for the oil and gas industry. High power fiber laser research was conducted at Gas Technology Institute of Des Plaines, Illinois to show proof of concept for drilling and other

operations. This research also included work on methane hydrates, acoustic tomography and concrete cutting applications.

This research was conducted under the supervision of Dr. Samih Betarseh and Mr. Brian Gahan during two summer internships in 2004 and 2005.

Jo Anna Ritchey assures me that this will be a very interesting program for our group.

### **A Note from the President**

After receiving the necessary passwords and related information, Leslie Ogg has been able to begin work to update the MSSC website. She is busy putting old bulletins online. Many thanks to Leslie and Herman Ruvalcaba for their time and efforts regarding the website.

#### **Change of MSSC mailing address**

**14728 Nanry Street, Whittier, CA 90604-1850**

**New webmaster Leslie Ogg email [logg@lausd.net](mailto:logg@lausd.net)**

### **Minutes of the April 10, 2009 Meeting**

The 853<sup>rd</sup> meeting of The Mineralogical Society of Southern California was held on Friday, April 10, 2009, at Pasadena City College, Pasadena, CA. President Geoffrey Caplette brought the meeting to order at 7:40 p.m.

Due to unforeseen circumstances, the scheduled speaker, Dr. Mary Johnson, was unable to attend. She will be invited to make a presentation at another meeting.

James Imai, Field Trip Chairman, provided directions to current wildflower locations, including the Antelope Valley Poppy Reserve.

Jo Anna Ritchey, CFMS Director, discussed the possibility of MSSC members displaying their respective mineral collections at the 2010 CFMS Show, to be held in Southern California. She also talked about the problems in identifying accessible, yet financially feasible, show locations.

Vice President Bruce Carter then solicited input from members about topics of interest for monthly meetings, so that speakers, in related fields, could be selected. It was determined that a wide variety of subject matter appealed to members. Members expressed interest in mineralogy, gemology, mining history, Dr. George Rossman's latest research at Caltech, JPL space-related developments, travelogues, and field adventures and finds.

Upcoming presentations will include the use of laser technology to study minerals, and collecting in Eastern Canada, Tanzania and Kenya.

Members also discussed different approaches to attracting students to MSSC meetings. Dr. Carter indicated that he gave a certain amount of extra credit to his students who attended meetings and events outside of the stated course curriculum. It was also suggested that meeting announcements be included in student publications.

The door prize was won by Ahni Armstrong.

President Caplette brought the meeting to a close at 8:50 p.m.

Respectfully submitted, Pat Caplette, Secretary

## **Celestron Handheld Digital Microscope**

By Leslie Ogg

Want a different, exciting, quick and fun way to view your mineral specimens? Try a handheld digital microscope. The one I use, a Celestron 44300, is small (less than 5 inches long) lightweight (3oz.) and is equipped with four white LED's for illumination. The resolution is about 1.3 mega pixels and in the pictures below, the field of view is one inch.

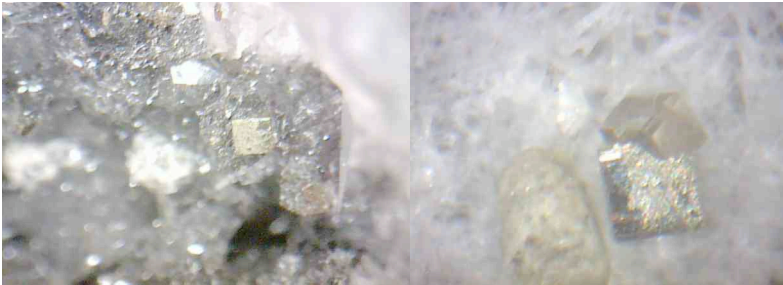


*The handheld digital microscope attached to a laptop computer.*

This particular microscope sells for less than \$100 at [microscopes.com](http://microscopes.com).

With some practice and patience you can take reasonably clear pictures with a magnification of 20x and 400x (manufacturer states, I don't think this number is accurate). The microscope connects to your Windows or

Macintosh computer via a USB connection. Once the software is running and the camera is connected, you will see your object on the computer screen. Taking a picture requires the push of a button on the end of the scope. Adjustments to the images can be made using the camera software or using photo editing software on your computer (Photoshop, Gimpshop, Picasa, etc.). Two main shortcomings of this camera are lack of depth of field, and LEDs that are too bright



*Both of these pictures were taken using the handheld microscope. The one to the left show pyrite crystal on calcite, 20x, and the one to the right show pyrite crystal on calcite, 400x (?). Both are specimens from Pacific Micromount Conference give-away tables.*

for some shiny or white minerals, making it difficult to get a clear view of the specimen.

I have used this microscope at the Pacific Micromount Conference for the last two years and found it useful for quickly previewing specimens. I visit the give-away table, pick up some samples, scan them with the microscope and



*Corundum, Cascade Canyon, 20x*

keep the ones I like.

I also use this microscope in my high school science classroom, the microscope is much simpler than a traditional optical microscope, and with the computer hooked up to an LCD projector everyone is

involved. The first view my students get of their fingertips magnified so that sweat can be observed evaporating from their pores immediately commands their full attention!

*At the MSSC March meeting, Leslie Ogg brought a small handheld digital microscope to the meeting. I was very impressed by the little gadget and what it could do. Unfortunately, the meeting time was short and not many members got to see the toy, so I asked Ms. Ogg if she would be kind enough to do a write up on the microscope so more members can learn about it too. Above is the article from Ms. Ogg about the microscope.*

*Do you have some instruments that you are very fond of and would like to tell other members about? Why not share it in the bulletin?—the editor*

## The Seventh Annual Sinkankas Symposium



By Shou-Lin Lee

Last year the featured stone of the Annual Sinkankas Symposium was garnet and it was quite a treat. After that symposium, I was really looking forward to this year's symposium. When I heard that the featured gem of this year would be spinel, I was curious about what would be presented.

No offense to spinel, but it is just not known or popular among the general public. Until several years ago, it was hard to find spinel both as gem and as specimen. To make the matter worse, the popularity of using synthetic spinel in "birthstone" jewelry, caused many people to know spinel only as a synthetic stone used to imitate a whole slew of other gems. If you own a class ring with a synthetic birth stone, chances are the stone is a synthetic spinel. An unfortunate fact

that creates difficulty for gem dealers who try to sell natural spinels. Some authors of gem reference books did not help the reputation of spinel either. In many gem reference books, when talking about spinel, the authors often mentioned that many historically famous spinels were known as ruby for many years. One book even went so far as to say that because of the hardness of ruby, it was not possible to fashion it before the advent of modern lapidary was available, all red gems in the old days known as ruby were in reality spinel. This only makes me wonder if all red color gems that were chemically magnesium aluminum oxide (also known as spinel) in the old days were known as ruby, why didn't modern mineralogists just name it ruby and name the red aluminum oxide a different name. This is one question I hoped to get an answer for at the symposium but did not get a chance to ask.

The organizers did not disappoint the participants and put out a full day of lectures. The program listed nine speakers as follow:

Si Frazier on "Spinel: History and Mystery,"  
Ed Boehm on "Spinel,"  
Skip Simmons on "Mineralogy & Crystallography of Spinel,"  
Jennifer Stone-Sundberg on "Synthetic Spinel,"  
Jo Ellen Cole on "Spinel – The Great Pretender,"  
Bill Larson on "Spinel in Color from Major Deposits,"  
Meg Berry on "Cutting Hints for Spinel,"  
Bob Weldon on "Photographing Spinel,"  
John Koivula on "The Micro World of Spinel," and  
George Rossman on "Color in Spinel."

I was glad to see that synthetic spinel was included as one of the topics. Gem collectors often view synthetic gems as imposters and speak of it only for the purpose of being able to separate it from the genuine article. However, research on how to synthesize certain gems often stems from practical



applications in certain technology. For instance, the need of untwined quartz in quartz movement led to synthetic quartz, or using synthetic corundum instead of glass for scratch resistant surface such as the supermarket scanner. I wondered what we use synthetic spinel for?

The lectures by Si Frazier, Ed Boehm, and Bill Larson's focused on spinel as a gem. Their presentations included: pictures of famous spinels with historical significance and their elustrial history; the relationship between spinel and its more famous "fraternal twin," ruby, mining history of spinel, worldwide occurrence of spinel, characteristic of spinel linked to their localities.

Dr. William Skip Simmons described the basic chemical composition of the spinel group. There are 22 members of the spinel group. The 22 members are further divided into six subgroups based on their chemical compositions: Aluminum Subgroup: spinel, galaxite, hercynite, ganhite; Iron Subgroup: magenesioferrite, jacobsite, magnetite, franklinite, trevorite, cuprospinel, brunogeierite, Chromium Subgroup: magnesiochromite, manganochromite, chromite, nichromite, cochromite, zincochromite, Vanadium Subgroup: vuorelainenite, coulsonite, magnesicolusonite, Titanium Subgroup: quandilite and virospinel. Noted that spinel is both the name of the group and the name of the specie. Unlike garnet group, of the 15 members within the garnet group there is not a spece of mineral call garnet.

Of these 22 members, only the magnesium aluminum oxide, also called spinel, was used as gems. Dr. Simmons then described the differences between various members of spinel and how they relate to each other.

Jennifer Stone-Sundbergm's presentation on synthetic spinel covered a brief history of several methods of growing spinel, why and where synthetic spinel are been used in industry. Synthetic spinel is used in industry because it is single refractive, has a high refractive index, and is relatively hard with good toughness.

Meg Berry presented a slid show of how she recut three faceted spinels. Ms. Berry explained that she had difficulty obtaining spinel roughs, but there were plenty of spinels that were cut badly and in need of further improvement. So she decided to talk about how to recut three spinels. The three stones she chose for this project had off-center cutlets that in turned caused undesirable visual effects.

Bob Weldon's presentation was both informative and a treat for the eyes. Mr. Weldon showed pictures of spinel in Dr. Edward Gublin's collections.

John Koivula's presentation on the inclusions in spinels and spinels as inclusions in other gems included pictures of a one and only real cat's eye spinel and a six-ray star spinel that had an unusual pattern. Mr. Koivula's photomicrographs were both scientific records of what is inside a mineral and were artistically executed. Trying to describe the pictures with just words is just not possible. So I would not attempt the impossible.

Dr. George Rossman described his research method on how to determine the cause of color in spinel. Pure spinel synthesized in the laboratory has no color. So then, where did spinel get its color? Dr. Rossman methodically explained how red spinel got its color from cromium, and how intervalence charge transfer of  $Fe^{+2}$  and  $Fe^{+3}$  gave magnetite that impenatratable black color.

With that, the symposium came to a close. Roger Merk, the organizer, announced that feldspar would the topic for next year.

## Brief visits to two Gem and Mineral Shows

By Shou-Lin Lee

The annual show held by the South Bay Lapidary and Mineral Society at the Torrance Recreational Center was an interesting one. It had most of the usual things you find in a club show: display, demonstration, kid's corner, used books,

used items, and plant sale. It was what it did not have that caught my attention. The show had no commercial vendors. The only one selling rock was the Society itself selling excess slabs. I got two picture jasper cabochons that belonged to one of their deceased members. I was told that the proceeds from the sale of this member's cabochons would go to their educational fund.

The show had many display cases including a fluorescence room. Some of the displays were quite impressive. For instance, there were several tables of large petrified wood slabs, most of them were at least one foot across. The majority of the slabs were self collected, cut and polished. I remembered that some years ago they had a very impressive display of fossilized pine cones.

There were many large specimens on display in the fluorescence room. I was glad to find a large hyalite from Spruce Pine, North Carolina that fluoresced bright green. On entering the show, guests were given rock sugar lollipop and invited to vote for the best display case. Another feature I did not see in other club shows.

The Antelope Valley Gem and Mineral Show was a fairly large show compared to most of the club shows in the Southland. It was held at Lancaster High School. In addition to the usual indoor vendors, it also had an outdoor tailgate sale.

One bonus of going to Antelope Valley was that I got to check out the Musical Road located at Avenue G. According to the News, there is a stretch of road in Lancaster that had grooves carved into the asphalt perpendicular to the direction of the road. As a result of the grooves, the driver will hear the William Tell's Overture when driving 55 miles per hour on the road.

It was the kind of story that I just had to check out for myself. According to the directions, the stretch is on Avenue G between 30<sup>th</sup> Street West and the airport, going west bound. As we were on the desolate stretch of street wondering "Are

we there yet? Are we lost?” all of the sudden, there was the music, loud and clear, even with the window closed. As soon as it stopped, I exclaimed: ”again!” We did not turn around because there was a restaurant called “Foxy’s” in the airport that we wanted to check out too. When we were hungry, food ruled.



*I was glad to find these red spinel crystals from Myanmar at the Antelope show. The nine crystals on the top row are single crystals, mostly octahedrons. The five crystals on the bottom row are twin crystals. The largest one weight 1.23 carat and the smallest one weight 0.22 carat.*

**COSTA MESA, CA - *the Spring Show***

## **WEST COAST GEM & MINERAL SHOW**

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## 2009 Calendar of Events

**May 1-3 2009, Bishop,** Lone Pine Gem & Mineral Society Tri  
County Fairgrounds Bishop Corner of Sierra St. & Fair  
Drive Hours: Fri. 6p.m.-10p.m.; Sat. 9:30-4; Sun. 10-3

**May 2-3 2009, Anaheim,** Searchers Gem & Mineral Society  
Brookhurst Community Center 2271 West Crescent  
Ave. Hours: Sat. 10-5; Sun. 10-4:30 Website:  
<http://www.searchersrocks.org>

**May 9-10 2009, Reno, NV** Reno Gem and Mineral Society  
Reno Livestock Events Center Exhibit Hall 1350 N.  
Wells Ave., Reno, NV Hours: Sat. 10 - 5, Sun. 10-4

**May 15, 16, 17 2009, Anderson,** Superior California Gem &  
Mineral Society Shasta District Fairgrounds Near  
Redding off hwy 273 Hours: Fri. & Sat. 9-5, Sun. 10-5  
Website: [www.superiorcal.com](http://www.superiorcal.com)

**May 16-17 2009, Newbury Park,** Conejo Gem & Mineral  
Club Borchard Park 190 Reno Road Hours: Sat. 9-5,  
Sun. 10-4:30 Website: [www.cgamc.org](http://www.cgamc.org)

**May 16-17 2009, Yucaipa,** Yucaipa Valley Gem & Mineral  
Society Yucaipa Community Center 34900mOaknglen  
Road Hours: Sat. 9-5, Sun. 10-4 Website:  
[www.yvgms.org](http://www.yvgms.org)

**May 30 -31 2009, Glendora,** Glendora Gems 859 E. Sierra  
Madre Ave. Glendora Hours: Sat. 10 - 5, Sun. 10-4  
**June 5-7 2009, Woodland Hills,** Rockatomics Gem &  
Mineral Society Pierce College Pierce College -  
Victory & Mason Hours: 10-5 Daily Website:  
[www.Rockatomics.org](http://www.Rockatomics.org)

**June 6-7 2009, La Habra,** North Orange County Gem &  
Mineral Society La Habra Community Center 101 W.  
La Habra Blvd. Hours: 9 - 5 both days Website:  
[nccgms.com](http://nccgms.com)