

The Opal Express

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Happy Thanksgiving!

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President's Message

Greetings Opalholics!

Happy Thanksgiving! Once again, it's been quite a year, but I think we all have many things to be grateful for. Family, friends, jobs - just to name a few. Now that the weather is getting little cooler, we'll be indoors more with more people. Please remember to wear a mask and get vaccinated if you can. We want to see you safe and healthy next year!

As you all know, this month we would have normally had our annual opal show. We're working very hard to make the show a reality again for 2022! Stayed tuned for details about the show and for in-person meetings.

As always, stay safe and healthy and keep busy!

Stan McCall
AOS President
Custom Creative Gem Cutting

Member area access is available only to members in good standing. Any other entry is unauthorized.

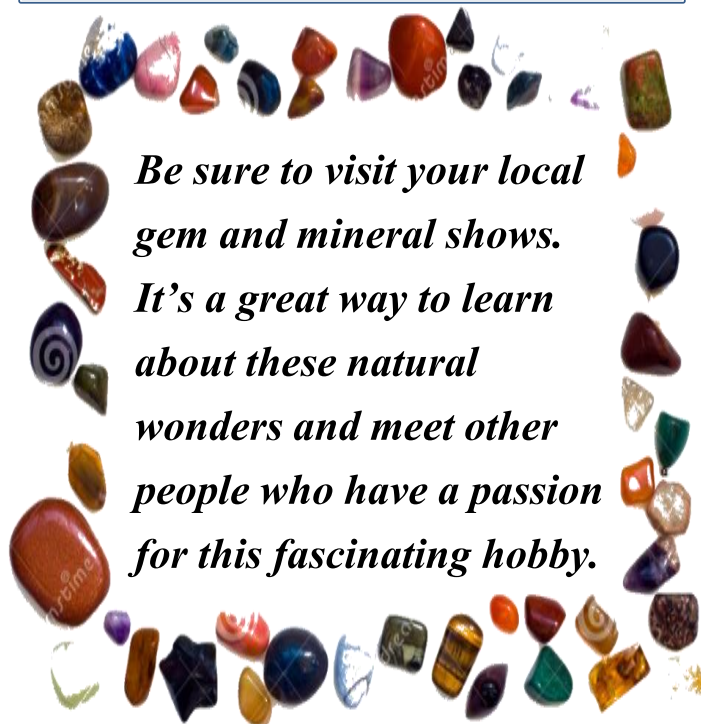
USER NAME: member
PASSWORD: 4BLuefiRE3 (case sensitive).



Let's extend a hardy AOS welcome to our newest member!

Edward Balsly

Thank you Edward for joining the American Opal Society!



Be sure to visit your local gem and mineral shows. It's a great way to learn about these natural wonders and meet other people who have a passion for this fascinating hobby.

Meet A Future Jewel Of Technology: Gem Of A Beetle Which Thinks It's An Opal

by Deborah Smith, Science Reporter
December 18, 2003



Pachyrhynchus argus - layers of transparent spheres packed in a precise hexagonal pattern in this beetle emulate that of the opal.

This Australian beetle really is a gem: the greenish scales on its back are identical to opal.

Andrew Parker, a former researcher at the Australian Museum, was amazed when he examined the internal structure of the scales under a powerful microscope and realised it was the same as that of the precious stone.

"This is the first time opal has been found in animals," said Dr. Parker, who is now at Oxford University in Britain.

The find could lead to a new method for synthesising opals, not only for use in jewellery, but as components, known as photonic crystals, for the computers of the future, which will rely on the movement of light.

The beetle, *Pachyrhynchus argus*, is commonly found in the rainforests of north-eastern Queensland. Its particular pattern of patches of metallic gleam had probably evolved to make it recognisable to other members of its species in the dim light under the forest canopy, Dr Parker said. "The optical effect created by this weevil makes it appear strongly coloured, whatever angle you look at it." The discovery is published today in the journal *Nature*.

The colour of most opals, and the beetle's scales, is the result of light being reflected from layers of transparent spheres, packed in a precise hexagonal pattern.

The beetle reflects only one colour because all of its nano-spheres are exactly the same size - about 250 nanometres across (a nanometre is a billionth of a metre) - whereas multi-coloured opals have a range of different sized nano-spheres.

Dr. Parker said that although liquid opals were easy to make, synthesising solid ones was notoriously difficult. His team has begun to try to fathom how the beetle creates an opal-like structure using the chemical "factories" inside its cells.

"If we can emulate the weevil's means of opal production this would represent a technological breakthrough, particularly since opal, as a photonic crystal, has numerous industrial applications," he said.

Scientists have already had some success copying nature, recently creating artificial mother of pearl by mimicking the way abalones build up nanolayers of different materials to make their shells.

But the beetle's method for making perfect opals posed a bigger challenge than this, because it probably used clever pieces of tiny machinery, such as molecular motors, and templates to extrude the nano-spheres, Dr. Parker said.

From the Sydney Morning Herald,
<http://www.smh.com.au>.

Did You Know?

Amulets in the form of scarab beetles were very popular in Ancient Egypt from 2,000 B.C. onwards. Soldiers often wore scarab beetles into battle as the insects were thought to have supernatural powers of protection against enemies.

~ Bench Tips ~

This page will be dedicated to bench tips and techniques from our readers. If you have bench tips you'd like to share, let us know! Bench tips can be anything - metal work, lapidary, wirework - anything creative that you would like to share. Send your tips to: aos.editor.02@gmail.com

MARKING YOUR TOOLS

by Brad Smith

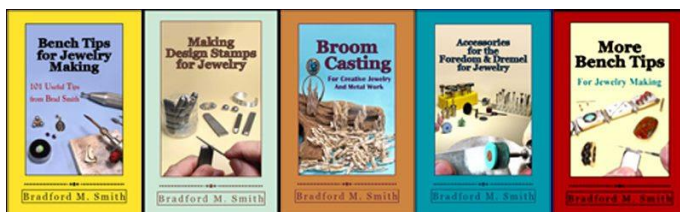
It makes sense to mark your tools if you ever lend them to friends or take them out to classes or workshops. The question is how to mark them permanently. For metal tools, I use a very small ball bur running fast in the Dremel or Foredom to "engrave" my initials. Other times, I'll form the initials with a number of hits with a center punch.

But for hammer handles and other wooden tools, the country boy in me came back and thought "Why not make a branding iron?" If you'd like to try one, all you need is a little scrap copper or nickel about 22-24 gauge, a piece of heavy brass or copper for a base, about 6" of metal rod and a piece of wood for the handle.

I formed my initials from a couple 4mm strips of sheet nickel. The "S" was one piece, but the "B" was three pieces soldered together with hard. Remember to form the letters backwards. I then soldered the letters with medium onto a piece of 1/8 inch thick brass bar to act as a heat sink. Finally, I soldered a piece of 1/8 round rod on the back of the brass bar as a shaft to join to a wooden handle.



Work Smarter & Be More Productive with Brad's "How To" Jewelry Books on [Amazon.com/author/bradfordsmith](https://www.amazon.com/author/bradfordsmith)



A New Artificially Reconstructed Ornamental Material



So-called "rainbow calsilica", showing multicoloured banding.

At the 2002 Mineral Show in Ste. Marie aux Mines in France, a beautifully coloured necklace consisting of banded opaque stones was offered for sale. The SSEF purchased two loose stones of this material weighing 46.11 ct and 36.14 ct. The gemstone merchant explained that the stones came from the USA and had been around for several years. He showed a photo of the mine as well as a certificate of authenticity from a US based geological laboratory, identifying this material as being natural.

The distributor in the USA specified that it is believed to come from the Chihuahua area, Mexico. The analysing geologist stated that the material can be described as "vein matter" or fracture filling due to a "copper push" which cuts a volcanic rock. The material itself was described as a microcrystalline calcite bonded with the amorphous clay mineral allophane. The geologist concluded that there had been "no evidence found that the hand of a man has been involved in the formation". Since opaque materials, especially when they appear to be made of several minerals, are relatively difficult to analyse with standard gemmological means, we decided to perform a Raman spectroscopic study on the two pieces. And as we have experienced many times in the past, our Raman spectrometer once again proved to be of invaluable help.

In the microscope, we could distinguish differently coloured layers of material (blue, several shades of green, reddish brown, white, black) containing

differently coloured small grains, all interspersed with larger partly idiomorphic white grains of various sizes. Around the larger grains and in between the layers a soft transparent material, sometimes with bubbles, was observed. With the Raman spectrometer, the white grains were identified as calcite. When we analysed the coloured grains, we noticed that the Raman spectra did not fit with any of the copper minerals we had in our library, but rather resembled the Raman spectra of artificial colours as observed in dyed coral. We then contacted a scientist who is analysing pigments in paintings (Dr. Peter Vandenabeele, University of Ghent in Belgium), and soon got the result: The Raman spectra of the dark blue grains compare well with the Raman spectrum of 20th century blue artist's pigments. The material could be identified as the copper phthalocyanine pigment PB15, a synthetic pigment which was developed in the 1930's. Similarly, the light greenish yellow areas contained the yellow mono-azo pigment PY1 (Hansa Yellow).

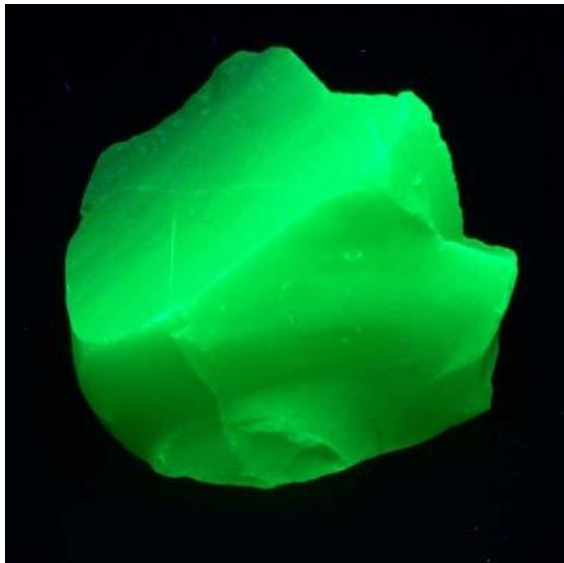
The soft plastic-like material turned out to be highly related to paraffin wax. From its appearance and spectrum, it is likely that the substance is an aliphatic polymer or a paraffin wax derivate mixed with other compounds unknown to us.

Besides calcite and these clearly man-made components, we also identified hematite in the red bands as colour-giving compound, and celestine in areas and layers which appeared black to the naked eye. Under 50x magnification the black areas turned out to be dark greyish green, with a multitude of different grains, transparent polymer-like layers and dyes.

The identification of pigments with Raman spectrometry is new in gemmology, but has been performed extensively for the identification of artists' pigments. Raman spectrometry has been applied for the identification of pigments in mediaeval manuscripts, polychrome sculptures, wall paintings and easel paintings, dating from antiquity until the 20th century. Now, through interdisciplinary collaboration, we could prove that the "rainbow calsilica" is not a natural material.

From the SSEF Facette No 10, January 2003

Is it Unusual for Opals to Fluoresce?



This specimen of opal is from Ogdensburg, New Jersey, and is shown fluorescing under short wave ultraviolet radiation. Common opal from Australia exhibits either no fluorescence or pale blue fluorescence. Males (1973) attributed the difference to wide spread contamination of American strata by uranium. Webster (1983) and Arem (1987) attributed the green fluorescence of New Jersey opal to uranium minerals present in the opal as impurities or, to be more precise, to the uranyl group (UO₂).

My mother recently gave me a lovely necklace that belonged to my grandmother. It has a row of 9 little pear-shaped rubies and a scattering of tiny full-cut diamonds (also 9 of them), but mostly it's an opal necklace. 43 small pear-shaped opals, very fiery, mostly blues and greens. The sort of opals you see in Edwardian jewelry.

I was checking it with my little fluorescent flashlight out of curiosity to see whether the diamonds had fluorescence. About half of them have medium or strong blue; the rest don't seem to have any. I was interested, but not surprised, to see that all the rubies lit up bright red under the blacklight. What surprised me was that the opals seemed to fluoresce blue-green, too.

At first I thought they were just reflecting the purplish blacklight of the flashlight. But when I turned it off in the dark after holding the blacklight close to it for a while, the fluorescent diamonds went on glowing for a few moments, as fluorescent diamonds do--and so did the opals. (The rubies, on the other hand, were completely dark as soon as the light went off.)

Is this common behavior for opals? Are they often fluorescent, and do they often go on glowing after the blacklight's gone?

Fluorescence: The emission of radiation (usually visible light) when a substance is irradiated by higher-energy radiation such as ultra-violet light.

Phosphorescence: The continuation of fluorescence after the activating radiation is turned off.

Source: "Rocks and Minerals" by O'Donoghue

Did You Know?

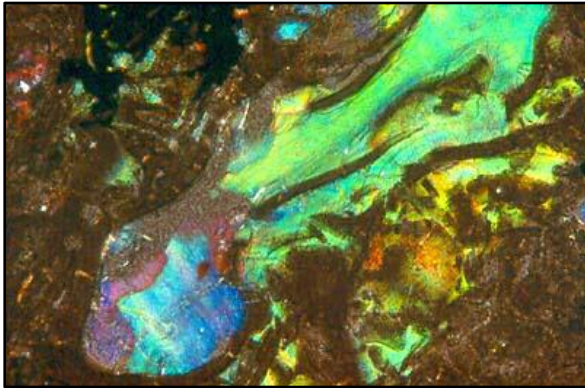
The term fluorescence is derived from the name of a rock. It was left to Sir George Stokes (1819 – 1903), a mathematics professor at the University of Cambridge, to give the effect its name. In the early 1850's Stokes noted the color shifting effects in the mineral fluorspar and investigated in greater detail.

<https://nightsea.com › articles › origin-term-fluorescence>

Opal Formation

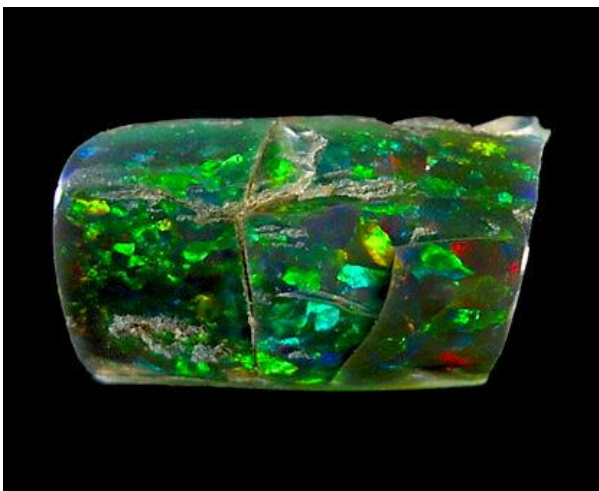
Formation Models

In general, opals are created when weathered silica seeps into cracks as a gel. The silica gel, containing large amounts of water, flows along faults and fractures within the rock. The water then begins to evaporate and the silica gel hardens. The rate of evaporation determines the opal's stability. Gem quality opals usually contain less than 10% water, meaning their water has evaporated more slowly.



Opal in Lava

Fire opals are found in ancient volcanic regions that consist of rhyolite, a silica rich rock. They are formed when gas cavities in the host rock were filled with silica-rich solutions.



Opalized Tree Limb

There are three specific models for opal formation.

(1) Deep Weathering Model

During the Tertiary period rocks experienced substantial weathering. With time, small amounts of silica were leached from sandstone by water which passed through more rock until it became trapped in underlying layers of claystone. Under the proper conditions, opal was produced from the trapped water left in porous areas. Faults would have served as a great path for silica to flow along.

(2) Syntectonic (Pecover) Model

Opal was deposited by heated water under pressure from the ground. This water flowed along faults, leaving opal nearby.

(3) Microbe Model

The claystone in which water and silica became trapped contained lots of fine fossilized organic matter. The feeding and waste production of these microbes created favorable conditions for opal formation.



Hungarian Opal

Continued on Page 7

Places, Geological Events Leading to Formation

In Australia, erosion has removed sufficient amounts of the older profile which allowed silica to collect and precipitate as opal within voids in the ironstone host rocks.

Geological processes such as folding and faulting that have occurred to the present have either completely removed the weathered profiles or left remnants of them as flat-topped landforms or low rises.

In regions such Virgin Valley, Nevada, canyon rhyolite was filled with layers of volcanic ash, like sediments and debris from pyroclastic flows. Over time the layers were buried by forests and hot ground water was then able to seep through the layers of ash, picking up silica rich deposits and permeated the buried wood. The carbon molecules were slowly replaced by the hydrated silica creating perfect opalized replicas of the original material.



Queretaro Region, Central Mexico

Occasionally, the silica gel would form in pools which completely immersed the wood, preserving it perfectly. Limb casts formed as the gel filled the cavities left by previously buried wood, long decomposed. Under the right conditions, some of this opalized wood could develop into precious opal. This requires a stable, quiet environment which allows the cristobalite spheres to line up in formation.

This unique alignment of the hydrated silica molecules creates reflection and refraction as white light passes through. This is the secret to the rainbow effect of the precious opal. The entire area has been uplifted and eroded, exposing the opal deposits in certain clay beds of ancient volcanic ash. The precious opal bearing layers may be as much as 10-30 feet below the surface and range in thickness from 2-12 feet. Common opal is abundant throughout the successive layers of clay and ash, but only specific conditions produce the spectacular play of color which characterizes the precious opal. Presently, opal is being mined from inland and arid environments.



Virgin Valley, Nevada



Australia

From:

<http://users.wpi.edu/~tlufkin/Geology%20Website/formation.htm>

UPCOMING EVENTS

Reader: If your organization has an opal or rockhound-related event, please email particulars to info@opalsociety.org.
Upcoming Event listings will be included at the discretion of The Opal Express editor as space and scheduling permit.

November 6-7, 2021, Concord, CA

Contra Costa Mineral and Gem Society
Contra Costa Annual Mineral and Gem Show
Centre Concord, 5298 Clayton Rd., Concord, CA 94518
Time: 10 AM – 5 PM each day
Mineral & Gem Show & Sale – Admission \$6, Under 16 Free with adult.
Scouts in Uniform Free. Military and First Responders Free with ID.
Gems, jewelry, mineral specimens, fossils, meteorites, beads, tools,
equipment, fluorescent room. Demonstrations, displays, kids activities,
door prizes, raffle and auction materials.
Email: mhopkins@ironhorsesdesign.net

Annual Show

Website: <https://contracostamineralandgemsociety.org/annual-show/>

November 6-7, 2021 – Ridgecrest, CA

Indian Wells Gem & Mineral Society, Inc.
Desert Empire Fairgrounds, 520 S. Richmond Rd., Ridgecrest CA
93555
Time: Saturday & Sunday 9 AM – 5 PM
Fieldtrip November 7th at 9 AM
Free admission!! Vendor spaces available. Goede purchasing and
cutting, petroglyph slab paintings, gems and minerals and jewelry.
Contact: (760) 375-7905, fjrocks@dslexreme.com

November 13-14, 2021 – Yuba City

Sutter Buttes Gem and Mineral Society
29th Festival of Gems and Minerals
Yuba – Sutter Fairgrounds
442 Franklin Ave., Franklin Hall, Yuba City
Saturday 10 AM – 5 PM, Sunday 10 AM – 4 PM
Contact 916 677-6696, horita@comcast.net
Website: <http://sutterbuttesgemmin.org>

November 20-21, 2021 – Lake Side, CA

El Cajon Valley Gem and Mineral Society
El Cajon Valley Gem and Mineral Society Annual Rock and Gem
Round-up
Lakeside Rodeo Grounds, 12584 Mapleview St., Lakeside, CA 92040
Time: Saturday 9 AM – 5 PM, Sunday 9 AM – 4 PM
Free admission and parking.
Contact: 619 729-7904, ecvgms@gmail.com
Website: <http://ecvgms.org>

November 20-21, 2021 – Santa Cruz, CA

Santa Cruz Mineral and Gem Society
Santa Cruz Live Oak Grange, 1900 17th Avenue, Santa Cruz, CA
95062
Time: 10 AM to 5 PM both days
Free admission and parking. Santa Cruz Mineral and Gem Society
annual holiday sale. Come and see wonderful gifts of nature and art
from around the world – gems, jewelry, rocks, minerals, and lapidary
arts. Browse the bargains and pick up some great gifts for the
holidays.
Contact: 408-644-7848, scrzmgms@gmail.com
Website: <http://scrockngem.org>

December 5, 2021 – Lake Elsinore, CA

Lake Elsinore Gem & Mineral Society
Rock 'n Craft Winter Festival, 32097 Corydon Rd., Lake Elsinore,
CA 92530
Hours: Sunday, December 5 – 10 AM – 4 PM
Contact: (909) 208-6956, berylman50@aol.com
Website: Facebook: Lake Elsinore Gem & Mineral Society

2022 Shows

January 15-16, 2022 – Exeter, CA

Tule Gem & Mineral Society
Exeter Memorial Building, 324 N. Kaweah Ave., Exeter, CA
Contact: (559) 802-6029

February 26-27, 2022 – Vallejo, CA

Vallejo Gem and Mineral Society
McCormack Hall, Solano County Fairgrounds, Vallejo, CA
900 Fairgrounds Dr., Vallejo, CA
Spring Bling 2022
Hours: 10 AM – 5 PM both days
Contact: (510) 377-4545
Website: <http://vjgems.co/>

March 5-5, 2022 – Ventura, CA

Ventura Gem and Mineral Society
Ventura County Fairgrounds, 10 W. Harbor Blvd., Ventura
Hours: Saturday 10 AM – 5 PM, Sunday 10 AM – 4 PM
Gems and Minerals, fossils, jewelry, healing stones, silent
auction, exhibits, dealers, kids activities, lapidary arts
demonstrations, raffle, flea market, plant sale. A successful and
valued South Coast show since 1963. We are happy to be back
again after COVID!
Website: <http://www.vgms.org>

March 12-13, 2022 – Arcadia, CA

Pasadena Lapidary Society
"Inspiration Unearthed", 62nd Annual Tournament of Gems
Arcadia Masonic Center, 50 W. Duarte Rd., Arcadia
Hours: 10-5 Daily
Contact: Ellen Ferrell 1-727-512-0381
Email: ellenbf2007@aol.com
Website: <https://www.pasadenalapidary.org>

March 12-13, 2022 – Turlock, CA

Mother Lode Mineral Society
Stanislaus Fairgrounds, 900 N. Broadway in Turlock, CA 95380
Hours: 10 AM – 5 PM daily
55th Annual Rock, Mineral & Jewelry Show! EDUCATIONAL
FAMILY EVENT! Rocks, Minerals, Fossils, Jewelry, Beads,
Fluorescents, Children's activities, and More! Learn to make
beautiful jewelry out of natural rocks and gemstones from our
demonstrators.
Children's activities including making your own bracelet, Touch
and See Rock cycle, Mineral and fossil display, Treasure Hunt,
Geode cutting. Large Fossil Museum including Megalodon
courtesy of The Tethy's Ocean Project. HUGE fluorescent walk-
through display room.
There are over 45 dealers selling rocks, minerals, fossils, jewelry,
beads, tools, & supplies. We have much much more. Visit our
website for more info and pictures!
Admission: \$6 adult, children 12 and under free with paid adult.
Contact: Bud & Terry McMillin (209) 484-4416,
terry.mcmillin@yahoo.com
Website: <http://www.turlockgemshow.com>

April 30 – May 1, 2022 – Anaheim, CA

Searchers Gem & Mineral Society
Hours: 10 AM – 5PM
Website: <https://searchersrocks.org>

American Opal Society Membership Application

FILL IN APPLICABLE INFORMATION		DUES / FEES	AMOUNT PAID
DUES:	RENEWING MEMBERS	\$35.00	
SELECT ONE	NEW MEMBERS	\$45.00	
INTERNATIONAL MEMBERSHIP FEE (All addresses <u>outside</u> of USA)		\$15.00	
PRINTED NEWSLETTER FEE (Paper copy postal mailed instead of PDF file by e-mail)		\$10.00	
ADDITIONAL BADGES (Your first badge is <u>free</u> when joining)		\$15.00	
TOTAL PAID DUES plus International, Print or Badge Fees if Applicable:			

Please make check or money order payable to "American Opal Society". Mail payment and application to:

American Opal Society: PO Box 4875, Garden Grove, CA 92842-4875

An optional quicker method of payment is via the internet. To pay via PayPal, please visit the membership page on our website at http://opalsociety.org/aos_application_by_web.htm to complete the form and make your PayPal payment. You may pay with a credit card or via PayPal account. The transaction is completely secure and the AOS never sees your credit card number. The AOS PayPal account is membership@opalsociety.org.

NAME	
BUSINESS NAME	
ADDRESS	APT # or PO BOX
CITY	STATE
ZIP OR POSTAL CODE	COUNTRY (IF OUTSIDE USA)
PHONE - Home ()	PHONE - Business ()
E-MAIL	
WEBSITE	
OCCUPATION	HOBBIES and INTERESTS

NAME BADGE ORDER FORM:

PLEASE PRINT NAME AS YOU WISH IT TO APPEAR ON YOUR BADGE using up to two (2) lines of text for your name, nickname, or name of your opal related business.

MEMBERSHIP ROSTER: The AOS publishes a membership roster once per year in its newsletter, The Opal Express. Your name will be included. Please check what additional personal information you listed for other members. If it is different from the information above, please note that on the application.

☐ Address ☐ Phone-landline ☐ Phone-cell ☐ E-mail ☐ Website

Please sign here: _____

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-Editor
Please address all inquiries and exchange newsletters to:
Editor - Kathleen James
The Opal Express
PO Box 4875
Garden Grove, CA 92842-4875
E-mail: aos.editor.02@gmail.com

Are Your Dues Due Now?

PLEASE CHECK YOUR ADDRESS LABEL OR NEWSLETTER E-MAIL.

There will be a date that shows the current month/year of your membership. If the date is older than the current date, your dues are overdue.

A Renewal Grace Period of two months will be provided. Please note, that as the system is set up, if your renewal is not received you will be AUTOMATICALLY dropped from membership thereafter. It is your responsibility to assure your dues are current.

Thank you.

The Editor

(revised 11/27/19)

The Opal Express

American Opal Society
P.O. Box 4875
Garden Grove, CA 92842-4875

Volume 54, Issue 11

— GENERAL MEETINGS —

4th Wednesday of the Month
7:00 p.m. - 9:00 p.m.

Anaheim Community Center
250 E. Center Street
Anaheim, CA 92805



TO:



**No General Meeting
for November**



General Meeting Location at:

Anaheim Downtown Community Center

250 E. Center Street
Anaheim, CA 92805

Stayed tuned! We may be starting up meetings again at the Anaheim Community Center. We are currently checking into getting our old room for meetings.

American Opal Society

Website: <http://OpalSociety.org>
Instagram: <https://www.instagram.com/opalsociety>
Facebook: <https://www.facebook.com/AmericanOpalSociety>
Pinterest: <https://www.pinterest.com/opalsociety>
YouTube: https://www.youtube.com/channel/UCegTIH1IEyO7y8wdqvRfyUA?view_as=subscriber

Stan McCall	President	(714) 220-9282
Russ Madsen	Treasurer	(562) 884-2254
Kathleen James	Editor	(714) 828-1251
Bart Gampe	Webmaster	(310) 736-5528
Veronica Purpura	Show Chairman	(714) 501-9959
Jamie Cassidy-Curtis	Secretary	

email: aos.president.01@gmail.com
email: aos.treasurer.01@gmail.com
email: aos.editor02@gmail.com
email: aos.webmaster.01@gmail.com
email: aos.showchair@gmail.com
email: jamec275@gmail.com