



SVAS

newsletter

Sacramento Valley Astronomical Society | founded in 1945

Vol. 57 no. 3 | March, 2000

Electromagnetic Spectrum and Astronomy

The February, 2000 meeting featured Chris Hulbe whom presented and demonstrated characteristics of the electromagnetic spectrum. Chris described advances in knowledge about the electromagnetic spectrum. These advances have been critical to astronomy, for it is through the electromagnetic spectrum that we can observe the universe. Sir Isaac Newton discovered that light can be broken into component colors and recombined as well. Through careful analysis of the spectrum of the sun, which was expected to show a continuous spectrum, peculiar "dark lines" or absences of certain narrow ranges of spectra were then noted.

Experimentation revealed that these resulted from the absorption of light that was idiosyncratic for each element. This allowed for the analysis of compounds through spectral analysis. For astronomy, this allowed for the categorization of stars, leading to advances in our understanding of the age, evolution, and distance of stars. These distance estimates arose from combinations of two observations. First, sources of energy that are approaching the observer appear to be higher in frequency (blue shift) and those that are withdrawing from the observer appear to be lower in pitch (red shift). Second, "shifts" in stellar spectra from the anticipated dark line spectra were observed.

When combined, the finding was that many stars and astronomical objects are receding (red-shifted) from our apparent position. This can best be accounted for by an expanding universe. This offers

support for the "Big Bang" model of the origin of the universe. Chris then demonstrated by way of spectrographic gratings that light sources that emit in various narrow wavelengths have characteristic spectra. The impact of these spectra upon vision were demonstrated through contrast, and apparent coloration changes. Chris showed how black is a phenomenon of contrast and how sodium vapor lighting leads to illusory color shifts due to its monochromatic nature. Chris showed how a white box can look black and turned a black shirt into a red shirt as demonstrations.

-Joe Riddle

The Deep Sky Magazine

Encourage the membership of the SVAS to join the National Deep Sky Observer's Society and in order to receive The Deep Sky Magazine. The NDSOS is a small group of amateur astronomers dedicated to observing deep sky objects. Deep sky objects are those astronomical objects that are outside of our Solar System. Members of the NDSOS are encouraged to record and submit their observations, through notes, sketches, or photos. They are very much like the SVAS, in as much as everyone's input is regarded as equally valuable, and there are no stupid questions. Each quarterly issue of The Deep Sky contains observing lists, articles of general interest, and observing hints and suggestions. Featured objects can be seen in a range of telescopes, from small to large. Subscriptions are twenty-four dollars per year, and can be submitted to Alan Goldstein, 1607 Washington Boulevard, Louisville, KY 40242. His e-mail is deepskyspy1@cs.com.

Your SVAS membership renewal is due before the end of March. Please consider renewing your SVAS membership. See page 7 for the Membership Renewal Form.

NEAR Team Digs into Data from Eros

Only a few days into the first close-up study of an asteroid, data from NASA's Near Earth Asteroid Rendezvous (NEAR) mission indicates that 433 Eros is no ordinary space rock.

Since the NEAR spacecraft met up with and began its historic orbit of Eros on Feb. 14, NEAR team members at the Johns Hopkins University Applied Physics Laboratory, which manages the mission for NASA, have pored over images and other early scientific returns. It will take months to unravel the deeper mysteries of Eros, but data from NEAR's final approach and first days of orbit offer tantalizing glimpses of an ancient surface covered with craters, grooves, layers, house-sized boulders and other complex features.

"Work is just starting, but it's already clear that Eros is much more exciting and geologically diverse than we had expected," says Dr. Andrew Cheng, of the Applied Physics Laboratory, who serves as the NEAR mission's lead scientist.

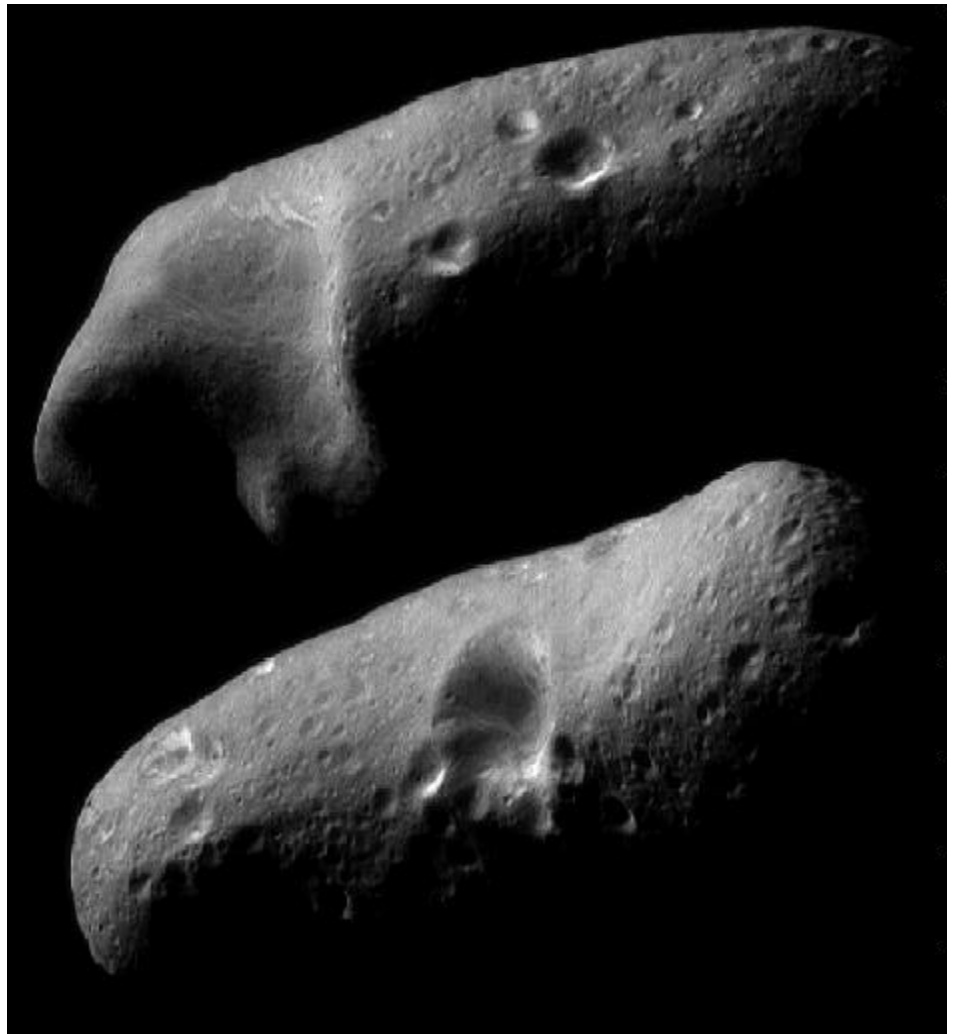
Scientists now know that Eros' mass is 2.4 grams per cubic centimeter - about the same density of Earth's crust and a near match of the estimates derived from NEAR's flyby of Eros in December 1998.

"With this new data, it now looks like we have a fairly solid object," says NEAR radio science team leader Dr. Donald Yeomans of NASA's Jet Propulsion Laboratory in Pasadena, Calif. "There is no strong evidence that it's a rubble pile like Mathilde," the large asteroid NEAR passed and photographed in 1997.

Even without in-depth analysis, pictures snapped with NEAR's Multispectral Imager offer several clues about Eros' origin, age and geography. The large number and concentration of craters point to an older asteroid. Uniform grooves across its craters and ridges hint at a global fabric of underground layers, which Cheng says could indicate Eros was once part of a larger body.

The digital camera has also captured brighter spots on the surface that NEAR scientists are anxious to study.

"One patch is about 25 percent brighter than the rest of the asteroid, and that's a very large difference from the ma-



The range to the surface was approximately 355 kilometers (220 miles). These two mosaics show the stark beauty of the two opposite hemispheres. The smallest detail visible is 35 meters (120 feet) across.

terials you expect to find on the surface," says Dr. Mark Robinson, a NEAR imaging team member from Northwestern University. "That's a really neat feature to keep our eyes on."

The spacecraft's Near Infrared Spectrometer has picked up variations in the asteroid's mineral composition, possibly proportions of pyroxene and olivine, iron-bearing minerals commonly found on Earth, the moon, Mars and in meteorites. A low-phase flyby during last weekend's final approach put NEAR directly between the sun and Eros, allowing the infrared instrument to gather unique data on the asteroid's mineral makeup under optimal lighting. Combined with multispectral images, this information will help form the first mineral map ever made of an asteroid. "We want to correlate the changes in color with the geologic features," says Dr. Scott Murchie, a science team member from the Applied Physics Laboratory. "If we see a crater, for example, is it different on the

outside than on the inside? Is the face of a cliff different than the ridge? This data will eventually tell us about the asteroid's history."

For the next year, NEAR's instruments will continue to examine the 21-mile-long, potato-shaped asteroid's chemistry, geology, and evolutionary history. The mission's radio science experiment will more precisely calculate Eros' density and mass distribution - clues critical to determining the asteroid's gravity and refining NEAR's orbit.

NEAR's scientific capabilities expand soon, when its X-ray/Gamma-Ray Spectrometer and Laser Rangefinder are turned on within the next two weeks. The spectrometer will measure important chemical elements such as silicon, magnesium, iron, uranium, thorium and potassium; the laser scans will determine Eros' precise shape.

Visit the NEAR Web site at <http://near.jhuapl.edu> for the latest images.

January General Meeting

Vice President Walt Heiges opened the 650th meeting at 7:41PM with the introduction of new members.

General Announcements

Claudia Hulbe asked for volunteers to help with the Science Center's annual Marsville event on Saturday, May 6th at McClellan AFB. This event for elementary and middle school students combines learning about Mars and learning to work as a team to construct habitats and life support systems for survival on Mars. Each team designs and builds a habitat from scratch using a set list of materials – what a lot of duct tape gets used! SVAS members participate as judges each year. If you would like to join them for an enjoyable morning with some very enthusiastic young people, contact Walt Heiges, Susan Strosahl, or Claudia Hulbe.

Astronomy Day is May 20th at Rush Park. Walt, also the director for Astronomy Day, reemphasized the need for volunteers to help with this annual event held nation wide and the need for more projects. Last year was a great success and to make this year even better we need lots of help. So mark your calendars and volunteer now. The sooner we get volunteers, the better organized we become, the less work each volunteer has to do, prevents last minute scrambling around trying to get everything done, and most importantly, Astronomy Day will be a greater success. Our goal this year is to have more interactive, hands on type projects. Dave Buchla past out a list of suggested projects during the November meeting. If you didn't get one please contact Dave or Bud Bafia for a copy. Bud is this year's site coordinator in charge of space utilization. His job is to assign areas for projects (first-come, first-served) so we can better utilize the facilities at Rush Park. He needs to know what project you have and how much space you will require. So, if you don't want your project to end up in the parking lot, get him the information ASAP. Also the money spent on projects is reimbursable through the club. If you want to be reimbursed for your project, save your receipts and file a voucher. Vouchers can be obtained from Walt. Contacts for Astronomy Day are: Walt Heiges (director) 684-3421 or WEHeiges@aol.com, Dave Buchla (project coordinator) 530-432-3359 or Bud Bafia (site coordinator) 991-6545 or HJBAFIA@worldnet.att.net.

Susan Strosahl (Public Star Party coordinator) explained to everyone how much fun it is to be part of a star party.

You don't have to be a rocket scientist or like Charles Messier to help with star parties. All you need is a telescope and your enthusiasm to view the stars. The club is trying to expand our star party region into the Davis area. Larry Synder (920-0247 evenings or weekends) will be the Star Party coordinator for that area. The dates for future star parties can be found in the newsletter or on the website at www.skywatches.org. Please contact Susan Strosahl at 785-5556 or susan_strosahl@hp.com.

Walt reminded everyone that March is membership renewal month. All members are asked to pay their dues during March. Dues are \$25.00 for general and \$75.00 for Observatory. Benefits of upgrading from general to observatory are use of the Henry Grieb Observatory (HGO) and unlimited access to the HGO facility. To become an Observatory member you must be a General

member for six months, be trained on the operation of the telescope in HGO and the building, certified to be responsible and qualified to use the facilities by Stuart Schulz (Observatory Director), and than approved by the SVAS board members. This process is necessary to ensure that the equipment and facility remain in good condition. The board has never disapproved an application.

Members who have been up to HGO this past year have noticed a new concrete slab and tower constructed next to the observatory. This is the beginning of a new observatory called Robert J. Mathews Observatory (RJMO). This observatory will house a second telescope to be used by schools via the Internet for educational purposes. The project was developed several years ago and funded by several major corporations and will be completed this spring after a reliable source of electrical power is installed (the next phase of the project).

Guest Speaker

Joe Riddle again entertained us with his exceptional knowledge of astronomy and how to star hop. He started with a fine demonstration of how to fumble around on a computer. He than introduced us to an object he found while observing the stars several weeks past. With the use of his laptop and sky program he illustrated how anyone can walk through the stars moving from one bright star to another to fine the object you are looking for. You don't need an expensive laptop computer, software program, and a huge telescope with drive motors to enjoy viewing the heavens. With a basic knowledge of the location of constellations, some sky charts and a good telescope you can find many of the millions of star objects in the sky. A list of excellent books for star hopping can be found on the front page of the January 2000 newsletter. He than answered some very good questions from members about telescope making, telescope use, sky software programs, and with the help of Chris Hulbe demonstrated the Earth and Moon orbital relationship. By logging on to egroups.com you can post any questions you have about astronomy. It is like a bulletin board where other people answer your questions.

Before closing the meeting at 9:15 PM Walt mentioned that March is election month for board members. The position of secretary will be open in March due to Marie Woodin resigning. She has been the club's secretary for several years and is stepping down due to the forthcoming birth of her new child. The secretary position includes attending both monthly Board and General meetings to record minutes, maintaining club records, and collecting and redistributing the mail.

Bud Bafia

School and Public Star Party Calendar

Please check your schedules and see if you can help with either of these. No experience is required! If you want to come out for either of these star parties with your telescope, please email me at: susan_strosahl@hp.com or call me at 785-5556. I will supply directions to those who sign up to each respective star party. Don't forget to wear lots of layered clothing, it will be cold this month!

1. Friday March 24

Location: Harmon Johnson School
2591 Edgewater Road off West El Camino between Del Paso Blvd and Northgate
People: 120, girl scouts, need 6 - 7 scopes
Setup 5:30pm
Sundown 6:33pm

2. Wed, March 29

Location: Mary Tsukamoto Elem School
8737 Brittany Park Dr., Sac Elk Grove district area, on the border
People: 200 people, need ~10 scopes
Setup 5:30pm
Sundown 6:27pm

3. Friday, April 7, 2000

Location: Quail Glen Elementary School
1250 Cane Vari, Roseville, CA
People 100 - need 7 telescopes
Setup 6:30 pm
Sunset 7:35 pm
Moonset 11:00 pm

4. Saturday, June 3, 2000

Girl Scouts, Regional I
Location: TBA

5. Friday, June 30, 2000

Girl Scouts, Local
Location: Albert Einstein Middle School
9325 Mirandy Drive, Rancho Cordova, CA

6. Saturday, Sept 23, 2000

Girl Scouts, Regional II
Location TBA



Travel to Mars for a Day

Have you wondered what it would be like to live on Mars? Do you know what would be required to build a colony on the Red Planet? How will life be supported on a planet so different from Earth? Now is your chance to learn the answers to those pesky little questions about living on Mars.

The Challenger Learning Center at the Discovery Museum in Sacramento will be hosting the fourth annual Marsville: The Cosmic Village. Each year, teams of students from area schools spend several months researching, planning, and communicating with other teams about living on Mars. They work with their teachers to plan the construction of their habitats and build their life support systems in preparation for the culminating event: Link-up Day. On this day, three teams form a crew, each crew builds a habitat, and all the habitats are linked together creating the Martian village!

You, too, can participate in this great event. Volunteers are needed to help with the coordination and progress of the day. Your helpful enthusiasm will add to the education of over one hundred hard working, motivated students. Areas of need include everything from award judges to parking supervisors. If you have as little as two hours or as many as six hours to spare on Saturday, May 6, 2000, please call Catherine (Cathy) Gray at the Discovery Museum at (916) 575-3941 by April 1. In addition to seeing the excitement on the faces of these students as their village literally grows before their eyes, you will be well fed with coffee and donuts in the morning and lunch at noon.

The Challenger Learning Center welcomes your partnership and participation in this premier space exploration and educational event. Who knows, maybe one of these students will be part of the first crew to actually travel to Mars!

Cathy Gray

Classifieds

For Sale: Mead LX 50 10" F/10 SCT
Goodies: tripod with equatorial super wedge, dual axis motors and hand controller keypad, variable power source AC/DC, 8x50 view finder and 1x orion Ezfinder, 24.5 super wide angle eyepiece, 1.25" eyepiece holder and 1.25" star diagonal, Meade heavy duty carrying case (foam lined), SCT viewing chair (handcrafted) and mini chair, dew shield.
Astrophotography goodies: Pentax ME camera body (needs work), lenses 28 mm, 50mm, 135 mm; illuminated reticule eyepiece 9mm, T-mount (Pentax) and T adapter, piggyback mount and adjustable camera mount, shutter trigger cable, tele-extender, counterweight system. \$2,500.00 FIRM. Contact Lloyd Townsend Home (530)756-5618 or niclsh@SOLISYS.COM

For Sale: Celestron C-8 Computerized. Purchased 12/15/98 for \$1929.43, will sell for \$1000 or best offer. Contact: Bill Hollister
Home: 916-652-2349 after 5PM
Work: 916-785-0827

For Sale: Orion 2 inch Skyglow broadband filter \$75.00. New condition. Contact George Storm at 916-731-4036.

If you love books and astronomy and have a few hours to spare, the Astronomical Society of the Pacific, located in San Francisco, has great need of a volunteer to help maintain our library. Contact Marilyn Delgado @415.337.1100 x100 or write to the Society at 390 Ashton Avenue, San Francisco, CA 94112.

COMET COMMENTS

by Don Machholz

Several comets have been discovered recently, none expected to be visible to us. Meanwhile, Comet LINEAR (1999 L3) is presently brighter than expected, positions are presented below. The magnitude predictions are estimates.

Kazimeras Cernis, a visual discoverer of three comets that bear his name, has now found a comet on images produced by the SOHO satellite. The comet was in a retrograde orbit and never got closer to the sun than 4 million miles. No earth-based observations were made of the comet. Perihelion was on Dec. 28. It is named C/1999 Y2. On Jan. 24, SOHO images yielded yet another comet, a Sungrazer. J.D. Shanklin found it. The LINEAR program found a comet on Dec. 7, and one each on Jan. 27 and 29. The Spacewatch program found one on Jan. 12. Not to be left out, the Catalina program found a faint comet on Feb. 4.

COMET HUNTING NOTES: A few amateurs have found comets on the SOHO images. The SOHO webpage carries images that have been quickly inspected for comets. Anyone can inspect the images and search for additional, fainter comets. This reminds me of the Palomar Sky Survey plates from which comets were discovered for decades.

EPHEMERIS

Comet LINEAR (C/1999 L3)

| Date(00UT) | R.A. (2000) | Dec | El | Sky | Mag |
|------------|-------------|---------|------|-----|------|
| 03-02 | 06h20.2m | +30d03' | 113d | E | 12.0 |
| 03-07 | 06h05.0m | +30d16' | 104d | E | 12.2 |
| 03-12 | 05h53.0m | +30d22' | 97d | E | 12.5 |
| 03-17 | 05h43.7m | +30d24' | 90d | E | 12.7 |
| 03-22 | 05h36.6m | +30d24' | 83d | E | 12.9 |
| 3-27 | 05h31.1m | +30d23' | 77d | E | 13.1 |
| 04-01 | 05h27.1m | +30d23' | 71d | E | 13.2 |
| 04-06 | 05h24.1m | +30d23' | 66d | E | 13.4 |

ELEMENTS

| | |
|--|--------------------|
| Object: | LINEAR (C/1999 L3) |
| Peri. Date: | 2000 01104.9101 |
| Peri. Dist (AU): | 1.988921 AU |
| Arg/Peri (2000): | 353.2987 deg. |
| Asc. Node (2000): | 140.1609 deg. |
| Incl (2000): | 166.0993 deg. |
| Eccen: | 0.974292 |
| Orbital Period: | 680 years |
| Ref: | MPC 37478 |
| Epoch: | 2000 02 26 |
| Absol. Mag ^m n ⁿ : | 7.8/4.0 |

Don Machholz (530) 346-8963 DonM353259@aol.com.
Web Page: <http://members@aol.com/cometcom/index.html>

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website!**

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Volunter Pledge Form for ASTRONOMY DAY



Circle the committee(s) you would like to participate in:

| | | | |
|-----------------------------|-------------------------------|----------------------------------|-----------------------------------|
| <i>SET-UP CREW</i> | <i>CLEAN-UP CREW</i> | <i>PUBLICITY</i> | <i>RAFFLE TICKETS SALE</i> |
| <i>REFRESHMENTS</i> | <i>INFORMATION BOOTH</i> | <i>DECORATIONS</i> | <i>PRIZE ACQUISITION</i> |
| <i>DISPLAY CONSTRUCTION</i> | <i>GREETING BOOTH</i> | <i>BALLOON COMMITTEE</i> | <i>TRANSPORTATION COMMITTEE</i> |
| <i>ASTROPAK COMMITTEE</i> | <i>JUNIOR ASTRONOMY BOOTH</i> | <i>DAYTIME TELESCOPE DISPLAY</i> | <i>NIGHTIME TELESCOPE DISPLAY</i> |

Participant Name: _____ Telephone: _____

Address: _____ City: _____

State/Province: _____ ZIP/Postal Code: _____

E-Mail: _____ Times Available: _____

WAIVER : Sacramento Valley Astronomical Society can not be held responsible for injuries incurred while assisting in preparing for and participating in Astronomy Day. We are not an employer and therefore do not carry Disability and Workman's Compensation Insurance. Your assistance is strictly voluntary and constitutes a waiver of such coverage.

Signature _____ Date _____

NOTE: ALL PARTICIPANTS MUST SIGN WAIVER (Parent/Guardian if under age)

WHOM TO CALL

(916) SVAS-111 To save time, press:

- 1-Last minute changes & updates for SVAS events
- 4-General Meeting information & location
- 5-Star party information & location

SVAS Web Page: <http://www.skywatchers.org>

1998 SVAS OFFICERS:

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Joe Riddle 488-5634

Alysse Rocha 985-4825

Susan Strosahl 920-0247

Welcome Chairman

Stosh Groner 989-9281

Telescope Making

Cary Chleborad 457-9115

WHERE TO MEET (See below for directions)

General meetings are held on the third Friday of each month, 7:30 p.m. at **Sacramento State University (CSUS), Mendocino Hall, Room 1015, 6000 J Street, Sacramento, CA.**

Visitors Welcome!

To Subscribe to the SVAS email list, send an empty message to svas-subscribe@makelist.com. Once subscribed, emails can be sent to svas@makelist.com.

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Articles—Manuscripts and letters are welcome preferably via email or 3.5" diskette, in Word or text format. Items may be mailed to *Anne-Marie Wheatley, 2320 Sanford Ct, Rescue, CA 95672*, or emailed to amwheat@ix.netcom.com. **Deadline for the following month's newsletter is the Wednesday following the SVAS General Meeting.**

Advertising—Commercial non-personal advertising, business card through full page, is available. Contact Sheri McFarland at 961-9667 for information.

Classified advertising is free to members of SVAS. Submit ads monthly to the SVAS Newsletter at the above address.

HGO

SVAS maintains the Henry Grieb Observatory (HGO) in the Sierras for members only.

Monthly star parties are also held at the site.

For directions and regulations, please call Vice President Walt Heiges at 684-3421

DIRECTIONS TO CSUS MENDOCINO HALL

From Hwy 50, take the Howe/Power Inn exit. At stop light, go straight across Howe. Go down two lights and turn right to enter the CSUS campus. Park in the parking lot across from the Hornet Bookstore. Mendocino Hall is located next to the Hornet Bookstore.

Membership Renewal/ New Member Application

Yes! Please renew my membership, or make me a new member of the Sacramento Valley Astronomical Society.

Renewal New Membership

General, \$25 — Enjoy monthly meetings, informative monthly newsletters, and awe inspiring views of the universe at monthly star parties.

Observatory, \$75 — Enjoy all the benefits of a general membership plus private use of the Henry Grieb Observatory (HGO). Must be a member for 6 months or longer, and must be approved by the Board of Directors.

1 year 2 years 3 years

Tell us about yourself...

Name(s) _____

Address _____

City _____ Zip _____

Telephone (_____) _____

E-Mail Address _____

Yes, I would like to be contacted about volunteering.

I agree to abide to the terms and conditions* governing use of the Henry Grieb Observatory property. I understand that failure to abide can result in revocation of use privileges and SVAS membership.

Signed _____ Date _____

*A copy of the HGO Rules of Operation and Regulations will be available upon request to all members.

Note: The term of annual membership is March-to-March. Dues for persons joining in September to December will be pro-rated. New members joining in January or February will be advanced to March.



Enclose payment and mail to:

**Sacramento Valley
Astronomical Society**
P. O. Box 15274
Sacramento, CA 95851-0274



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SVAS Calendar of Events

Please call SVAS-111 to verify event locations, dates, and times.

March

- 4 — **Star Party**, Latrobe (open only to members and their guests).
- 16 — 7:00 pm. **Board Meeting**, Denny's at Watt & Auburn.
- 17 — 7:30 pm. **652nd General Meeting** at CSUS Mendocino Hall, Room 1015.

4 Room 1005.

General Election.

April

- 1 — **Star Party**, Latrobe (open only to members and their guests).
- 20 — 7:00 pm. **Board Meeting**, Denny's at Watt & Auburn.
- 21 — 7:30 pm. **653rd General Meeting** at CSUS Mendocino Hall, Room 1015. Speaker: TBA

May

- 6 — **Star Party**, HGO (open only to members and their guests).
- 18 — 7:00 pm. **Board Meeting**, Denny's at Watt & Auburn.
- 19 — 7:30 pm. **654thrd General Meeting** at Rusch Park at 7801 Auburn Boulevard, Citrus Heights. This month's meeting will be a special Astronomy Day "Work Party." Please come prepared to help set up for Astronomy Day.
- 20 — **Astronomy Day** Noon-10:00 pm, Rush Park, 7801 Auburn Blvd. Citrus Heights

General Meetings are held on the 3rd Friday of the month at CSUS Mendocino Hall (next to bookstore) Room 1015

Star parties are held on the closest Saturday to the new moon at the Henry Grieb Observatory (HGO) or at Miller's Hill School (Latrobe) and are open only to SVAS members and their guests.