



# SJAA EPHEMERIS

## SJAA Activities Calendar

Jim Van Nuland

### March

- 1 Dark Sky weekend. Sunset 6:02 p.m., 28% moon rises 3:36 a.m.
- 8 Dark Sky weekend. Sunset 6:09 p.m., 3% moon sets 7:41 p.m. **Messier Marathon at Henry Coe Park.** Henry Coe Park's "Astronomy" lot has been reserved.
- 9 DST starts at 2 a.m. Advance clocks 1 hour.
- 14 Astronomy Class at Houge Park. 7:30 p.m. Mark Wagner will discuss observing galaxies.
- 14 Houge Park star party. Sunset 7:15 p.m., 58% moon sets 3:41 a.m. Star party hours: 8:00 until 11:00 p.m.
- 22 **General Meeting at Houge Park.** 8 p.m. Our speaker is Dr. Adrian Brown of the SETI Institute. His topic is "Latest Results from the Mars Reconnaissance Orbiter."
- 28 Houge Park star party. Sunset 7:27 p.m., 55% moon rises 2:28 a.m. Star party hours: 8:30 until 11:30 p.m.
- 29 Dark Sky weekend. Sunset 7:28 p.m., 45% moon rises 3:13 a.m.

### April

- 5 Dark Sky weekend. Sunset 7:34 p.m., 0% moon sets 7:31 p.m. Henry Coe Park's "Astronomy" lot has been reserved.
- 11 Houge Park star party. Sunset 7:40 p.m., 44% moon sets 2:27 a.m. Star party hours: 8:30 until 11:30 p.m.
- 19 Board Meeting and auction rehearsal at Houge Park. 6 p.m. until it "works".
- 20 **Auction XXVIII at Houge Park.** Open at noon. Selling 1 p.m. to about 4 p.m. (Note: Sunday, daytime)
- 25 Astronomy Class at Houge Park. 7:30 p.m. Topic: TBA
- 25 Houge Park star party. Sunset 7:52 p.m., 72% moon rises 1:08 a.m. Star party hours: 9:00 until midnight.
- 26 Dark Sky weekend. Sunset 7:53 p.m., 62% moon rises 1:48 a.m.

*The Board of Directors meets before each general meeting. Call the hotline for the exact time.*

### March General Meeting

**Dr. Adrian Brown**

**March 22, 2008 - 8 p.m. - Houge Park**

David Smith

The Mars Reconnaissance Orbiter spacecraft has collected stunning images on the Red planet since it arrived at Mars last year. Scientists like Dr. Adrian Brown at the NASA Ames Research Center are poring over the data to work out what Mars is telling them about its history as a planet through the eyes of the CRISM (Compact InfraRed Imaging Spectrometer for Mars) and the HiRISE (High Resolution Imaging Science Experiment) camera.

Dr. Brown will give an overview of MRO, and talk about Martian polar research that is shedding light on the most active regions on Mars today, where oceans of water are locked away in perpetuity at the polar caps. Or are they?

## The Golden State Star Party 2008

Bill Porte

The Astronomy Connection (TAC) organizations of the San Francisco Bay Area, the Sacramento Area, and Southern California have officially announced The 2008 Golden State Star Party. This event will be held on four nights at their exciting new dark site near Adin, California from July 2 through July 6, 2008.

The GSSP has a long successful history that began with the first Lassen Star Party in 1994, followed by many years of first-rate star party events in Lassen and Shingletown venues. Over these years, the organizing committee has searched for the "perfect site" with ink black skies and no intrusive light domes, 360 degree horizons, minimal dust problems, and an area big enough to fully accommodate a large group of avid astronomers and their gear. In 2007, this site was finally found in a ranch near Adin.

GSSP is one of the premier Star Parties in California, now featuring the darkest skies, plenty of room and accommodations for camping and RV's, on-site food services, showers, sanitary facilities, ice, and water. Off-site accommodations and services are also available in the nearby towns of Adin and Bieber. In addition to unparalleled stargazing at night, there are many daytime attractions and activities nearby as well. GSSP is 100% organized and run by astronomers for astronomers. At this new venue, and with the support of avid astronomers and the local community, GSSP promises to be an annual event that will rival the top

*Continued on page 4*

**24 hour news and information hotline:  
(408) 559-1221**

# DEEP SKY OBSERVING

by Mark Wagner

March 2008 third quarter to new moon observing list. The list begins in the north and moves southward. Targets are rated 1 to 4 for challenge, with 1 being very easy, 4 being most difficult. All objects are within one hour of right ascension, north to south, in the east at astronomical dark. More objects are in the full list which is at <http://www.resource-intl.com/Deep.Sky.Mar.08.html>

Rating	Object	Const.	Type	Size	Mag	R.A.	Dec.
2	NGC 2655	Cam	GX	6.6'x4.8'	11.0B	08 55 38	78 13 28
	Bright core, face-on shape, with a twirl in the arms, interesting at 126x.						
2	NGC 2787	UMa	GX	3.1'x2.0'	11.8B	09 19 18	69 12 12
	Very small, faint (mag 10.8) round galaxy with a non-stellar center.						
2	N2805	Uma	GX	6.3'x4.7'	11.5B	09 20 19	64 06 07
	Faint, large, irregularly round, very low surface brightness.						
3	NGC 2742	UMa	GX	3.0'x0.5'	12.0B	09 07 33	60 28 46
	160x shape sharpens to a diamond, with a slight brightening at the center - not well defined.						
2	NGC 2768	UMa	GX	8.1'x4.2'	10.8B	09 11 37	60 02 22
	very bright, moderately large, elongated 2:1 E-W, faint halo extends to 3.0'x1.5'.						
3	N2756	UMa	GX	1.7'x1.1'	13.2P	09 09 00	53 50 55
	Elongated with a bright core, at mag 13, and larger by 1/3 than NGC 2639.						
2	NGC 2681	UMa	GX	3.6'x3.2'	11.1B	08 53 32	51 18 52
	Bright core, looking face-on, big with plenty of dust, 4 foreground stars.						
3	N2639	UMa	GX	2.1'x1.3'	12.6B	08 43 38	50 12 20
	Nice elliptical galaxy elongated 4:1 with a 2:1 elliptical core.						
3	NGC 2782	Lyn	GX	3.8'x2.5'	12.3B	09 14 08	40 06 08
	small circular galaxy with a point core at 100x, The core is more diffuse at 210x						
2	Arp 315	Lyn	GX2	2.4'x1.9'	11.9V	09 19 46	33 44 59
	NGC 2830 and 2832 in center of AGC 779.						
2	NGC 2683	Lyn	GX	10.5'x2.5'	10.6B	08 52 41	33 25 03
	Superb galaxy, edge on stretch out 6:1 with bulge at core. The best at 100x, some mottling.						
1	M44	Cnc	OC	95.0'	3.1	08 40 24	19 40 00
	Beehive cluster, best viewed in wide field telescope or binocular. Naked eye.						
1	M67	Cnc	OC	29.0'	6.9'	08 51 24	11 49 00
	Nice moderately loose with large numbers of stars visible. Easily seen in the finder.						
2	NGC 2775	Cnc	GX	4.2'x3.4'	11.0B	09 10 20	07 02 19
	Obvious, bright core, possible spiral with diffuse halo. Maybe elongated NW/SE.						
2	NGC 2613	Pyx	GX	7.2'x1.7'	11.2B	08 33 22	-22 58 24
	Not too small, but dim low surface brightness, elongated roughly E/W.						
2	N2784	Hyd	GX	6.2'x2.2'	11.3B	09 12 18	-24 10 22
	Very bright, mod large, very bright core, much fainter extensions, elongated 2:1 WSW-ENE						

Note: Source catalogs are Messier, Arp, Abell Planetary, Abell Galaxy Cluster (AGC), Hickson Compact Galaxy (HCG), Sharpless III Regions, Barnard Dark Nebulae, Herschel 400-I, Herschel 400-II. Herschel 400-I are identified as NGCXXXX, Herschel 400-II as NXXXX.

## Zosma

Paul Kohlmeier

Zosma is the star that could be called the butt of the lion. The head of Leo the lion takes the form of a backwards question mark. Alpha Leonis, better known as Regulus, is at the bottom of the question mark and it would be a front paw. Beta Leonis is called Denebola and it shows the tail of the lion. Denebola forms a right triangle with the stars Chertan (the back paw) and Zosma (the, er, ahem, top of the tail). A nice map of Leo is at <http://www.astro.uiuc.edu/~kaler/sow/leo-t.html>.

While most star names have Arabic origins, Zosma comes from the Greek and it could be translated as "girdle". Not very masculine, methinks.

There is, of course, an Arabic name for this star, Dühr, which could be translated as "hip" - a better fit.

Zosma is an A4 star. Many of the stars that can be seen with the naked eye are A stars, there are more than 75 such stars within 100 light years. It is 23 times as luminous as the sun though its radius is just about double that of our star. It is 58 light years away. Zosma has the somewhat unusual characteristic of being a very fast rotator while still being a main sequence star. It completes a full rotation in half a day which means it spins 90 times faster than the sun.

Zosma is part of a stream of stars called the Ursa Major Stream. This is a set of stars that all appear to be moving in the same direction and at the same speed. Sirius is another star in this stream.

Zosma has been studied for quite a while so we know things about it including its apparent age. It is approximately 700 million years old and stars of its type run out of hydrogen for fusing after a billion years. So even though Zosma is much younger than the sun, it is really over the hill and I know just how it feels. Zosma will eventually become an orange giant star and spend its retirement years as a white dwarf.

Despite the relative closeness and intense study made of Zosma, it is not clear if it is a variable star or not. If it is, it is of a type called Delta Scuti. These stars do not vary in magnitude very much. They also have multiple pulsation

periods and each of these periods are superimposed on each other resulting in beats and dips in the measured magnitude. The typical apparent magnitude of Zosma is 2.56 and the absolute magnitude is 1.29.

### Bayer Star Names

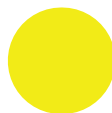
The brightest stars in a constellation are given designations based on their relative brightness within the constellation. The brightest star is called Alpha, the next is Beta and so on through the Greek alphabet. The Latin possessive (aka genitive) form of the constellation is used with the Greek letter. Thus the first four brightest stars in Leo are called Alpha Leonis, Beta Leonis, Gamma Leonis and Delta Leonis.

These star names were proposed by Johannes Bayer in the early 17th century. These names are obviously limited by the 24 characters in the Greek alphabet. For more information on this and other star naming schemes see <http://www.astro.uiuc.edu/~kaler/sow/starname.html>.

Zosma is a triple star system (the companions are at magnitude 9 and 13) and it does not have a dusty disk around it which would have indicated the possibility of planetary formation. By comparison Denebola appears to be a solitary star and it does have a dusty disk. Perhaps it is the stellar companions around a star that tend to sweep up the leftovers after stellar formation.

Leo is of interest these days because Saturn is hanging out in this area, not far from Regulus. On March 8, Zosma transits just 10 minutes after midnight.

Whenever I want to look up information on a particular star I start with Google and search on "Kaler *starname*" using the common or Bayer name for starname and don't use the quote marks.



### OBAFGKM

Stars are classified based on their surface temperatures. The original intent was to classify them alphabetically, A, B, C and so on. But upon further review (as they say in the NFL) it was determined that the spectrum of the O stars (the one thought to be at the end) was really showing those stars to be the hottest stars. Similarly, A and B were transposed and many other designations were confused because of binary stars and other complications. So the resulting order of the stars became OBAFGKM. To see example spectra go to <http://apod.nasa.gov/apod/ap010530.html>. This order is often memorized with a mnemonic device such as "Oh, be a fine girl, kiss me." Feel free to alter the phrase to match your preference. Further modifications to the classification scheme occurred with dimmer, cooler stars were found. So L stars are cooler than M stars and T stars are even cooler. In addition, some people use R, N and S classifications although I believe these are mostly subclasses of M stars. To see more about mnemonic devices used to memorize the classification order, go to <http://astro2.byu.edu/~sdb/Mnemonic.html>.

---

## Notification of May General Meeting

Rob Hawley

Normally we only have one General Meeting per year in February. In a general meeting we ask the club members attending, or voting by proxy, to cast votes on club business. In February this year we asked the members to vote on candidates for the board of directors. We also asked them to consider an amendment to correct a procedural difference between our original bylaws and the normal parliamentary procedures for conducting meetings.

In reviewing the bylaws this fall I found three other areas where the procedures should be improved. I presented these three proposed changes to the board during the January meeting and the board voted that we should ask the members to approve them. Unfortunately the bylaws require us to give the members notice before such a vote can occur. There was not enough time to give this notice before the February meeting. Thus the board is notifying the members that the May meeting will be a second general meeting where these three amendments will be considered.

### 1) Definition of Absence

<http://www.sjaa.net/Change%201%20Modification%20of%20Definition%20of%20Excused.pdf>

---

### GSSP

*continued from page 1*

Star Parties in the country, including the Oregon and Texas Star Parties.

GSSP is intended for the pure enjoyment of all astronomers. It is a wonderful opportunity for astronomers to get together and observe under California's spectacular Summer skies. Early Registration is now in full swing until April 15. The all-inclusive registration fee is only \$45. For more information, visit the official GSSP website at <http://www.goldenstatestarparty.org> or contact [info@goldenstatestarparty.org](mailto:info@goldenstatestarparty.org).

Under the current bylaws a board member is excused if he gives the board prior notice. The current mechanism allows someone to continue to be a non contributing member as long as he remembers to send an email. It is only after being forgetful for three times that such a non-productive member can be removed.

The proposed change requires that members participate in the meetings either in person or by proxy. The existing bylaws provide for a means to cast votes by proxy. Doing so means the member is contributing to the operation of the club. Failure to either attend or cast votes by proxy will be counted as an absence.

### 2) Qualifications for Board

<http://www.sjaa.net/Change%202%20Qualification%20for%20Board.pdf>

The bylaws are inconsistent on the qualifications to be a board member. One section gives several methods of qualifying for board membership. These include being a member for 12 months, but also include attending a certain number of meetings. This meeting schedule is different from what we use. Amendment 1 states simply you have to be a member for 12 months.

The proposed amendment makes the "be a member for 12 months" the rule.

### 3) Notification of Candidacy

<http://www.sjaa.net/Change%203%20Notification%20Requirements%20for%20Directors%20E.pdf>

The existing bylaws allow candidates not nominated by the Nominating Committee to start a complicated process to notify members of their candidacy. In the era before the internet such a process was required. These days there are three ways of communicating with the members; the Ephemeris, our announce mail list, and our website. The proposed amendment provides the candidate access to these faster and cheaper routine methods of communication.

Of course there is no absolute requirement for entire prior notification process anyway since the bylaws also permit a candidate to be nominated at a meeting.

The board believes each of these changes are in the best interest of the club.

---

### Silicon Valley Astronomical Lecture Series

## **Geoff Marcy on March 5, 2008 at 7 p.m.**

Andrew Fraknoi

On Wednesday, March 5th, at 7 p.m., Astronomer Geoff Marcy of the University of California, Berkeley, will give a non-technical, illustrated talk on: *New Worlds and Yellowstone: How Common are Habitable Planets?* as part of the Silicon Valley Astronomy Lectures in the Smithwick Theater, Foothill College, El Monte Road and Freeway 280, in Los Altos Hills, California. Free and open to the public.

Star Trek and Star Wars would have us

believe that the universe is teeming with habitable planets and advanced species of life. In reality, after the discovery of more than 250 planets orbiting other stars, both Earth-like planets and extraterrestrial intelligence have proved elusive. Soon, new telescopes will begin hunting such planets.

Join the scientist who has discovered more planets than anyone else in history in a discussion of what these telescopes are likely to find.

Imagine someday taking a driving tour of the surface of Mars. You trail-blaze across a dusty valley floor, looking in amazement at the rocky, orange-brown hillsides and mountains all around. With each passing meter, you spy bizarre-looking rocks that no human has ever seen, and may never see again. Are they meteorites or bits of Martian crust? They beg to be photographed.

But on this tour, you can't whip out your camera and take on-the-spot close-ups of an especially interesting-looking rock. You have to wait for orders from headquarters back on Earth, and those orders won't arrive until tomorrow. By then, you probably will have passed the rock by. How frustrating!

That's essentially the predicament of

the Spirit and Opportunity rovers, which are currently in their fourth year of exploring Mars. Mission scientists must wait overnight for the day's data to download from the rovers, and the rovers can't take high-res pictures of interesting rocks without explicit instructions to do so.

However, artificial intelligence software developed at JPL could soon turn the rovers into more-autonomous shutterbugs.

This software, called Autonomous Exploration for Gathering Increased Science (AEGIS), would search for interesting or unusual rocks using the rovers' low-resolution, black-and-white navigational cameras. Then, without waiting for instructions from Earth,

AEGIS could direct the rovers' high-resolution cameras, spectrometers, and thermal imagers to gather data about the rocks of interest.

"Using AEGIS, the rovers could get science data that they would otherwise miss," says Rebecca Castaño, leader of the AEGIS project at JPL. The software builds on artificial intelligence technologies pioneered by NASA's Earth Observing-1 satellite (EO-1), one of a series of technology-testbed satellites developed by NASA's New Millennium Program.

AEGIS identifies a rock as being interesting in one of two ways. Mission scientists can program AEGIS to look for rocks with certain traits, such as smoothness or roughness, bright or dark surfaces, or shapes that are rounded or flat.

In addition, AEGIS can single out rocks simply because they look unusual, which often means the rocks could tell scientists something new about Mars's present and past.

The software has been thoroughly tested, Castaño says, and now it must be integrated and tested with other flight software, then uploaded to the rovers on Mars. Once installed, she hopes, Spirit and Opportunity will leave no good Mars rock unturned.

Check out other ways that the Mars Rovers have been upgraded with artificial intelligence software at <http://nmp/TECHNOLOGY/infusion.html#sciencecraft>.



*Are these rocks of any scientific interest? With the new AEGIS software, the Mars Rovers, Spirit and Opportunity, will be able to judge for themselves whether a scene is worth a high-resolution image. (Artist's rendering.)*

*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.*

---

## Letter from the President

As you are reading this my first year in office is coming to a close. This has certainly been a year of change for the club. I believe the club is much stronger now than it was 12 months ago.

In the last 12 months

- We have revitalized our Beginner's Astronomy Class. We now regularly have as many people attending these programs as the regular meetings.

- Our web site has a completely new look thanks to the contributions of a number of members. It is now much easier to find out information on club activities and to communicate status (such as weather cancellations) than before.

- We have added a new program, the Beginner's Workshop, where the club will help people use their own scopes. This program will expand in 2008.

- The club has made major investments in the loaner program. Prior to 2007 the program was limited by what was donated. Starting in 2007 we began a complete reevaluation of the inventory. Several scopes were eliminated as not being suitable. Another scope is being rebuilt by noted designer (and General Meeting Speaker) Albert High. Several additional scopes have been or are in the process of being donated. We also have documented, repaired, and, in some cases, improved the scopes that remain.

- CalStar has returned to its roots. Starting in 2007 the Golden State Star Party committee composed of some of the most active local amateurs is once again involved in the planning of CalStar. SJAA continues to operate the event, but now with GSSP assistance. I am looking forward to our partnership continuing in 2008.

One of the most important changes has been internal. Your board of directors is now much more involved in the operation of the club than it has been since I have been a member. For example, the loaner program is now a partnership between myself and Vice President Rich Neuschaefer. In addition, other board members such as Lee Hoglan have offered their services.

Under the leadership of board member Gordon Reade the Ephemeris production process is now much less stressful.

Our school program remains strong thanks to the continuing work of Jim Van Nuland and others. The Coyote program will resume this summer.

Next year we will continue work on the loaner program. The delivery of 3 planned donations should have occurred by the time you read this. We are thinking about rebuilding our 18" scope this summer. Now that we understand the inventory better we will continue to ask ourselves whether the inventory meets the needs of our members. We will ask ourselves if there are enough beginner scopes. We also need to cast a critical eye on some of the remaining inventory to make sure these are the right scopes for our members.

As a member your contribution is critical also. Your dues and donations at the auction enable the club to make these improvements. Our member volunteers make our star party system work. Your positive response to the improvements we have made encourage us to do more.

Thank you for all the help you have given us. We will need your continuing help to keep the momentum going another year

*Rob Hawley*



### The Last 31 Days In Astronomy

JAN-24-2008 **Giant Storm on Jupiter** A pair of storms on Jupiter were caught in the act of a merger last spring. Hubble photos recorded the storm which appears similar to previous events in 1975 and 1990. <http://www.jpl.nasa.gov/news/news.cfm?release=2008-013>

FEB-11-2008 **Atlantis delivers Columbus** The space shuttle Atlantis took off from Cape Canaveral on Feb. 7 and delivered the European Space Agency's laboratory called Columbus. The addition of Columbus emphasizes the I in the ISS. <http://www.space.com/missionlaunches/080211-sts1222-first-spacewalk-wrap.html>

# Messier Marathon

Rob Hawley

The annual Messier Marathon will be held at Henry Coe State Park on Saturday March 8.

Charles Messier was a French comet hunter in the late 1700s. To prevent him from misidentifying "non comets" he started cataloging them. This led to the first list of non-stellar objects. The equipment Messier used would barely qualify as beginner equipment today. Thus his list of 110 objects is also the list of the brightest non-stellar objects in the sky.

I will let the reader explore on his own the history behind the list and focus instead on what we will be doing on the 8th. By chance during March all of the Messier objects are visible at some point during the night. True some objects you will have to dig out of the twilight from the light pollution of Morgan Hill and San Jose. At least one of the morning objects has never risen before twilight during the times I have done the marathon. But the rest are all there for the taking.

This is not an opportunity to "see" the objects. There are times when you will have to spend mere seconds on each object. This is especially true in the early evening and after 3 AM in the morning.

So why do the marathon?

Well if you are a type A, goal oriented person (like the author) then the challenge of completing the list is reward enough.

For everyone else I believe a different focus is appropriate. I originally did the marathon for the challenge, but realized I learned a lot about how to efficiently use charts and locate objects. For me that is the true value of the marathon.

It is an absolute requirement that you have excellent charts before you attempt the marathon. But more than that you need to be able to use the charts efficiently and that requires some planning.

The classic book on the marathon (The Observing Guide to the Messier Marathon) was written by long time member and comet hunter Don Machholz. The search strategy of Machholz's book assumes an Equatorial mount (move xx degrees N yy degrees W). These directions are less useful to someone with a Dob. Thus in 2006 I published the charts generated by my Planetarium Program SkyMap Pro which I had used in my first two marathons. Links to my charts will be available from

the SJAA web page.

Both sets of instructions provide detailed strategies for the hard sections of the search (e.g. Virgo).

The approach in my charts is the same 3 chart levels approach used in my Star Hopping 101 class. You start with high level charts to orient yourself. You then switch to the finder charts to refine your location. In the most crowded parts of the sky a third set of charts allows you to move through Virgo at the eyepiece.

I have done the marathon with 5 different scopes ranging from 100 mm to 15". Almost all objects can be easily seen from Coe even in the 100mm. A 6-10" scope would be ideal.

This year's marathon is the earliest in March since I have been a member. That means you will have the best shot at getting those morning and evening objects.

SJAA will make object lists available before the event. I strongly recommend you use a checklist such as this to keep track of what you have seen.

See the web site for detailed directions to our observing spot.

## Officers and Board of Directors

**Pres** Rob Hawley (408) 997-6526  
**VP** Rich Neuschaefer  
**Sec** Craig Scull (408) 292-9317  
**Tres** Gary Mitchell (408) 265-2336  
**Dir** David Smith (408) 978-5503  
**Dir** Lee Hoglan  
**Dir** Gordon Reade  
**Dir** Robert Armstrong  
**Dir** Mark Wagner

## Ephemeris Staff

**Editors** Paul & Mary Kohlmiller (408) 848-9701  
**Circulation** Gordon Reade  
**Printing** Accuprint (408) 287-7200

## School Star Party Chairman

Jim Van Nuland (408) 371-1307

## SJAA Email Addresses

Board of Directors board@sjaa.net  
 Membership ?'s membership@sjaa.net  
 Chat List chat@sjaa.net  
 President president@sjaa.net  
 Treasurer treasurer@sjaa.net  
 Announce sjaa-announce@sjaa.net  
 Secretary secretary@sjaa.net  
 School Star Parties schools@sjaa.net  
 Ephemeris ephemeris@sjaa.net  
 Web Page pkohlmil@best.com  
 Circulation circulation@sjaa.net  
 Telescope Loaners loaner@sjaa.net  
 Members Email Lists:  
<http://www.sjaa.net/majordomo.html>

## Publication Statement

SJAA Ephemeris, newsletter of the San Jose Astronomical Association, is published monthly.

San Jose Astronomical Association,  
P.O. Box 28243  
San Jose, CA 95159-8243

The SJAA Ephemeris is published in three formats: hardcopy, Adobe Acrobat PDF, and HTML. The PDF and HTML versions are found at <http://ephemeris.sjaa.net>.

Articles for publication should be submitted by the 10<sup>th</sup> of the previous month. The PDF version is generally available by the 24<sup>th</sup> of the previous month and the HTML version by the last day of the previous month.

San Jose Astronomical Association  
P.O. Box 28243  
San Jose, CA 95159-8243

Nonprofit Organization  
U.S. Postage Paid  
San Jose, California  
Permit No. 5381

**ADDRESS SERVICE REQUESTED**

## San Jose Astronomical Association Membership Form

P.O. Box 28243 San Jose, CA 95159-8243

**New**     **Renewal** (Name only if no corrections)

**I'll get the Ephemeris newsletter online**

<http://ephemeris.sjaa.net> Questions?

Send e-mail to [membership@sjaa.net](mailto:membership@sjaa.net)

### Membership Type:

- Regular — \$20  
 Regular with Sky & Telescope — \$53  
 Junior (under 18) — \$10  
 Junior with Sky & Telescope — \$43

Bring this form to any SJAA Meeting  
or send to the club address (above).

Please make checks payable to "SJAA".

Subscribing to Sky & Telescope magazine through the SJAA  
saves you \$10 off the regular rate. (S&T will not accept multi-year  
subscriptions through the club program. Allow 2 months lead time.)

You can join or renew online:

<http://www.sjaa.net/SJAAmembership.html>

**Name:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**City/ST/Zip:** \_\_\_\_\_

**Phone:** \_\_\_\_\_

**E-mail address:** \_\_\_\_\_