

BULLETIN

volume 85, issue 1 *January 2011*

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**85 YEARS OF ASTRONOMY IN
LOS ANGELES**

Los Angeles Astronomical Society
Griffith Observatory
2800 East Observatory Ave.
Los Angeles, CA 90027

Change of Address, Membership:
Stephen Dashiell, LAAS Secretary

LAAS Officers:

President..... Mary Brown
Vice PresidentRichard Roosman
TreasurerJohn O'Bryan
Treasurer@laas.org
Secretary.....Stephen Dashiell
Secretary@laas.org
Recording SecretaryRichard Roosman

Volunteers:

Library Mary Brown
nwwrgz@yahoo.com
Outreach..... Don DeGregori
& Herbert Kraus
Outreach@laas.org
Loaner Telescopes Dave Sovereign
(626) 794-0646
Messier Program Michael Rudy
mrcapk9_groups@yahoo.com
New Members..... Andee Sherwood
Coordinator@laas.org
Speakers Bureau Tim Thompson
timthompson3@verizon.net
Youth Liaison (not assigned)
Youth@laas.org
Bulletin Editor.....David Nakamoto
BulletinEditor@laas.org
Bulletin PrinterRichard Roosman
Web Site ManagerStephen Dashiell
webmaster@laas.org
Contributing Authors..... Tim Thompson
Carla Johns

Editor's Corner

This month begins the term of our new board, including a new president.

The new board is :

President: *Mary Brown*
Vice President: *Richard Roosman*
Secretary: *Stephen Dashiell*
Treasurer: *John O'Bryan*
Directors: *Carla Johns*
Michael White
Herbert Kraus
Herman Meyerdierts
Don DeGregori
Timothy Thompson
Andee Sherwood
David Sovereign
John Price (alt)

Mary Brown has the distinction of being the first woman to head our governing board ! Join me in welcoming the 85th version of the board as they meet the challenges ahead !

Remember we open Garvey Ranch Park Observatory every Wednesday night around 7:30pm or so. Telescope making, astronomy debates and conversations, and an excellent 8-inch f/15 refractor (well, the refractor is excellent even if the location is not) are just some of the goodies members can enjoy.

I wish to extend my thanks to those LAAS members who regularly support our outreach efforts.

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However, we can always need more help at these activities, so please consider volunteering your time. Since things can change at the last minute, you need to have email access and inform our outreach coordinators of that address. They can be reached at outreach@laas.org.

Articles, short news or story items, and photographs and images are welcome as long as they're focused on LAAS interests. Articles need to be 1,500 words or less. Please submit only a few images at one time, with a caption for each. Include such information as camera type, telescope or other equipment used, and exposure times, where pertinent. The deadline for submitting bulletin material is the 10th of each month. If possible, please submit electronically to:

BulletinEditor@laas.org

Material may be sent to the LAAS address listed at the top of the column at left, but timely reception and publication cannot be guaranteed. ✧

David Nakamoto

New Members

The new members approved at the October board meeting are :

- Reynold Burbank
- Heather Cano
- Rose Clayton
- Michael Faye
- Guadalupe Garcia
- William and Will Jr., Grant
- David, Terrance, and Theodore Lem
- Richard Magleby
- Eric Sosa
- Russell Zazueta

Welcome to our club, and we hope you'll enjoy your Astronomy with all of us ! ✧

Two for the Price of One

by Timothy Thompson

Our sun resides in the disk of the flat spiral galaxy we call the Milky Way. That disk is where the vast majority of new stars are born to the Galaxy and stars tend to form in clusters. So, as we just let our eyes wander along the clear path of stars that define the Milky Way, from our inside out point of view, we can see not only a lot of stars but a lot of bright knots of stars that are young open clusters. In binoculars the view is quite impressive, but many are clearly visible to the unaided eye. No doubt many of us are used to prowling the prominent summer Milky Way, towards the center of the Galaxy, where binoculars reveal many open & globular clusters. The view towards the north, away from the center of the Galaxy, might seem less appealing at first glance. But there is an interesting sight to see along the Milky Way, about two thirds of the way down from the star Ruchbah (δ (delta) Cassiopeia) towards the star η (eta) Persei you will find two fuzzy patches close together that are easily visible to anyone under a dark sky. They are cataloged as NGC 869 & NGC 884 but more commonly known as η and χ (chi) Persei, or just the Double Cluster. Clearly visible to the naked eye, the Double Cluster must have been "discovered" in prehistoric times, but it appears to have been first cataloged by Hipparchos in 130 BC.

Before we get around to anything really astronomical, we at once confronted by the mystery of the names. Greek letters are assigned to individual stars, and only very rarely to other astronomical objects. So, where did η & χ Persei get their names? I don't think anyone actually knows. O'Meara & Green take a crack at the problem in the February 2003 issue of Sky & Telescope. Their guess is that Tycho Brahe measured one position for the "nebulous star" that is in fact the Double Cluster, and Johann Bayer designated that star as χ -Persei. Bayer switched to Roman letters only after he ran out of Greek letters, and must have assigned the name η -Persei later to a nearby star. The only thing that bothers me about this guess is that I can see that the Double Cluster is in fact double, and I know there are LAAS astronomers with better eyes than mine. With good eyes and much darker skies than we have, I am hard pressed to believe that Tycho Brahe could see only one "nebulous star"

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The Double Cluster: NGC 869 (h-Persei) on the right, and NGC 884 (c-Persei) on the left. Image Credit: Roth Ritter, from Astronomy Picture of the Day, 3 Jan 2009.

and not two. Still, it is the most reasonable idea presented to date, and probably true.

There is also a Messier catalog "mystery", though it does not seem so mysterious to me. In a 1988 issue of the *Journal of the British Astronomical Association*, one Jack Fletcher says "It is strange that Charles Messier should not have included these clusters in his famous catalog". The last version of Messier's catalog that was actually published by Messier appeared in 1781, listing all of the objects up to M100. M101 – M104 appeared in that catalog as objects attributed to Pierre Mechain, with the note that Messier had not yet seen them himself. Objects after this, while appearing in his observing notes, were added to his catalog later by other people and never appeared in Messier's catalog. Messier originally made his catalog as a list of things that he might confuse with comets. But he later added non-cometary objects to his list so he could publish a catalog bigger than Herschel's. Certainly the Double Cluster is far more likely to be confused with a comet than something like M45 (the Pleiades open cluster) but the Double Cluster is in the Milky

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Way, and Messier did not routinely search the cloudy Milky Way for comets, so it is unlikely he would have run across the Double Cluster in his comet hunts. But for whatever reason, he did indeed overlook the Double Cluster, which apparently does not appear in his observing notes at all.

The Double Cluster is too far away for a parallax distance and there are no Cepheid variables. In fact, there are no variable stars cataloged for the Double Cluster at all. So the most reliable tool left for distance determination is main sequence fitting. This is done by making a color – magnitude diagram (CMD) for the cluster (this is a Hertzsprung – Russell diagram) and fitting the apparent brightness of the main sequence stars to their known brightness, corrected for the reddening effect of the dust & gas between us and the clusters (about 0.55 magnitudes for h-Persei, 0.52 for c-Persei and 0.52 for the halo stars). The distances so derived are 2290 +87/-82 parsecs for h-Persei, 2344 +88/-85 for c-Persei and 2344 +88/-85 again for the common halo that surrounds both clusters (one parsec, abbreviated pc, is the distance that corresponds to one arcsecond of parallax and is equal to about 3.26 light years). The distances are not affected by any subtle differences between the evolved stars in the two clusters, since only main sequence stars are used, so the difference in distance is likely real and implies that h-Persei is slightly closer than c-Persei. However, the uncertainties cited are large enough that formally we can only say that both clusters are about the same distance from us, roughly 2300 pc or 7500 light years (ly). At that distance the separation between the cluster cores, about 27 arcminutes, corresponds to 18 pc or 59 ly. The clusters are similar in size, although the core of h-Persei, 3.8 pc across, is slightly more compact than the core of c-Persei, which is about 4.8 pc across. The common halo that surrounds both clusters is roughly spherical and about 41 pc or 134 ly across.

It is possible to derive distances directly from trigonometric parallax, and then use those distances to calibrate other indirect methods, like the well know period – luminosity relationship for Cepheid variables. However, there is no direct measurement for age. The only way to determine the age for a star, or a cluster of stars, is compare the data sample with artificial data derived from models of stellar evolution. We do need to know the distance in order to do this right, and since the distance in this case also depends on stellar evolution models used for main sequence fitting, you can see that reliable models are a must. But that's another article of its

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own, so for no trust me, the models are good and it all makes sense (or, maybe better still, don't trust me, get your own degree in astrophysics and prove we are all wrong). In essence, the process is quite similar to that used for distance determination, fitting the observed stellar population to a model CMD. Using pre main sequence stars, the ages for both clusters and the halo are all the same, 14 ± 1.9 - 1.4 million years (Myr). Using post main sequence M supergiant stars instead yields an age 13.5 ± 1.5 Myr for all three. Finally, fitting the shape of the main sequence turnoff (where the main sequence blends into the subgiant branch) yields an age of 14 ± 1 Myr for c-Persei, 13.5 ± 1.5 Myr for h-Persei, and 13 ± 2 Myr for the halo. It's a good assumption that the clusters were formed at roughly the same time, but which age is the real one? The answer is that all of them are. Each method is perfectly valid, but each method is based on different stellar types and so naturally yields slightly different ages. But like the distance, the uncertainties on all of these ages are large enough that they are all formally indistinguishable from each other. So the best we can say is that both clusters, and the halo, are all roughly 14 ± 2 Myr old. This is young enough that only the most massive stars that formed in the clusters will have evolved past the red giant stage of stellar evolution, hence the dearth of massive or evolved stars in the Double Cluster.

The Double Cluster is unusually massive, as open clusters go. With a total of about 20,000 solar masses, the Double Cluster is equal in mass to the massive, and much younger Arches cluster near the Galactic center. But the Arches cluster is top heavy, with a much higher proportion of massive stars than one would normally expect. But while the Double Cluster is massive, it is not top heavy. Spectral classification of 10,983 stars throughout the entire Double Cluster reveals one class O6.5 main sequence star, 914 B stars, 1330 A stars, 4362 F stars, 2525 G stars, 1300 K stars, and 551 M stars. The large number of F & G stars, compared to the OBA stars is most likely due to the original mass distribution of the cluster, but the smaller number of K & M stars is due to survey incompleteness (K & M stars tend to be dimmer, so we will not see them all). Certain cluster members cataloged are 3,129 stars for h-Persei, 2,471 stars for c-Persei and 7,380 stars for the halo, a total of 12,980 cataloged stars. Of course, the actual number of stars will in all cases be higher than the number cataloged, especially considering our incomplete ability to observe the dimmer low mass stars, and should likely

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exceed 20,000 stars altogether. So h-Persei carries about 4,700 solar masses, while the lighter & smaller c-Persei carries about 3,700 solar masses and the halo holds about 11,000 solar masses of stars.

Throughout most of the winter the Double Cluster will be well placed in our northern evening sky and relatively easy to find. Visible to the naked eye, it is an excellent object for binoculars or low power telescopes. Relatively nearby, the Double Cluster is rapidly becoming a target of study for infrared and X-ray astronomers, who can combine their observations with optical data in the ongoing study of star formation and stellar physics. ✧

Image of Jupiter Garvey Ranch Park Refractor



The image was taken on Dec 1st 2010 by David Nakamoto using the Garvey Ranch Park 8-inch dia. f/15 (120 inches or 3050mm focal length) refractor, which was donated to the LAAS by the late Joe Addison, who passed away on March 10th 2010. A series of videos were captured using a Philips model SPC 900 NC web camera which was fitted with an eyepiece adapter and uses a CCD chip to image. The camera was attached to the prime focus

of the refractor. The individual images in the video were then aligned with the center of Jupiter as the target, then stacked using Registax freeware, which was designed to handle this process quite automatically and effortlessly.

The resulting image is not the best due to some atmospheric turbulence, and chronic shaking of the telescope possibly due to the drive motor for the mount. This caused some artifacts in the image; the faint arcs on the left and right side of Jupiter is one. South is up. I also turned up the color saturation to help bring out details. Webcams tend to act like medium to high magnification eyepieces. Comparing the original image with the screen 24 inches away from the eye with visual impressions gives a rough estimate that the magnification in this case is about 300x, the same as a 10mm eyepiece. The image here is a small portion of the original, digitally enlarged.

The image does show an interesting set of events. The Red Spot is plainly visible above center on the disk. The Southern Equatorial Belt, which went missing during most of this year's Jupiter viewing, appears to be still missing; it should be between the Red Spot and the equator of Jupiter. The Northern belt is plainly visible. Just below and to the left of the Northern Belt is a faint dark spot, but this is not a moon nor a moon shadow crossing the disk. As a matter of fact, Europa is just inside the right upper edge of the disk, and its shadow is visible just inside the left edge of the disk, plainly visible. It was much harder to see visually. If you spot a faint smudge of light at the 4 o'clock position off of Jupiter's disk, that would be Ganymede, getting ready to pass in back of Jupiter. Callisto and Io were the only two moons not engaged in any shenanigans that night, both being well off to the left of Jupiter and out of frame.

Even with the seeing affecting the view of Europa's shadow visually through this refractor, the webcam still recorded a lot of detail in the Jovian atmosphere that was not apparent to me when I looked through the refractor that night.

Jupiter is nearing the end of its current viewing season, being high in the south at nightfall. More transit and shadow events will be visible in the few months we have left before it dives behind the Sun. Take the time to go out and view it! ✧

David Nakamoto

Outreach Program

We've got a large number of requests despite the Recession and the cutback in school funding.

We especially need people living in the San Gabriel Valley to go to outreach events there. Nearly all of the regular volunteers live in the San Fernando Valley, so the need in the "other" valley is great.

Come on out to the school and show all the enthusiastic kids, parents, and teachers the night sky. They always appreciate it. And if you get WOW's when they look through you scope, you'll feel good. If no scope, come out anyway and help up set up or answer questions from the kids. So, Outreach volunteers, let's pitch in. I'm sure the kids and adults will appreciate our effort.

Thanks !

Outreach@laas.org (818) 891-3087 ✧

(Editors Note: Be aware that often these requests come with very little advanced notice. Therefore, we won't post any events in the bulletin. The best way to get news of these events is to use the Internet and join the LAAS Yahoo group. To join the LAAS Yahoo group, see below.)

Don DeGregori

LAAS Email Lists

The LAAS maintains two E-mail lists, *for LAAS members only*, a general list and an announcements list. Instructions for joining either list can be found in the LAAS webpages:

http://www.laas.org/Resources_Newsgroup.htm

Or look at the bottom of this article for instructions.

The announcements list is intended for announcements of events such as upcoming speakers, special star parties, or other functions planned by the LAAS board. General members are not expected to respond on this list, just to receive announcements. It is a very low traffic list. *Every member should join this group.*

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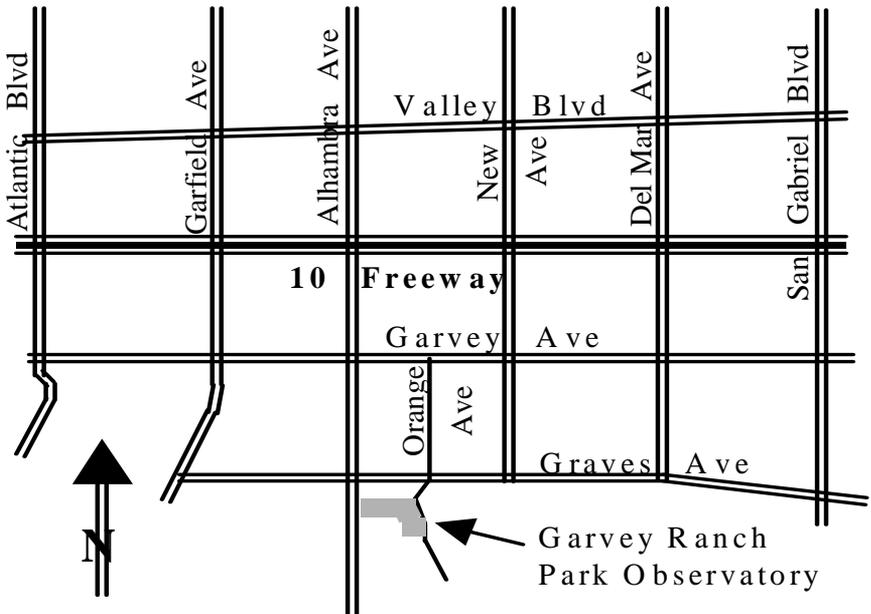
The general list is intended for use by all LAAS members to communicate with each other; ask questions about events, ask questions about astronomy or the LAAS, plan your own events, ask for help with a telescope, or just talk about something relating to astronomy. Traffic will vary greatly depending on member interest & current events.

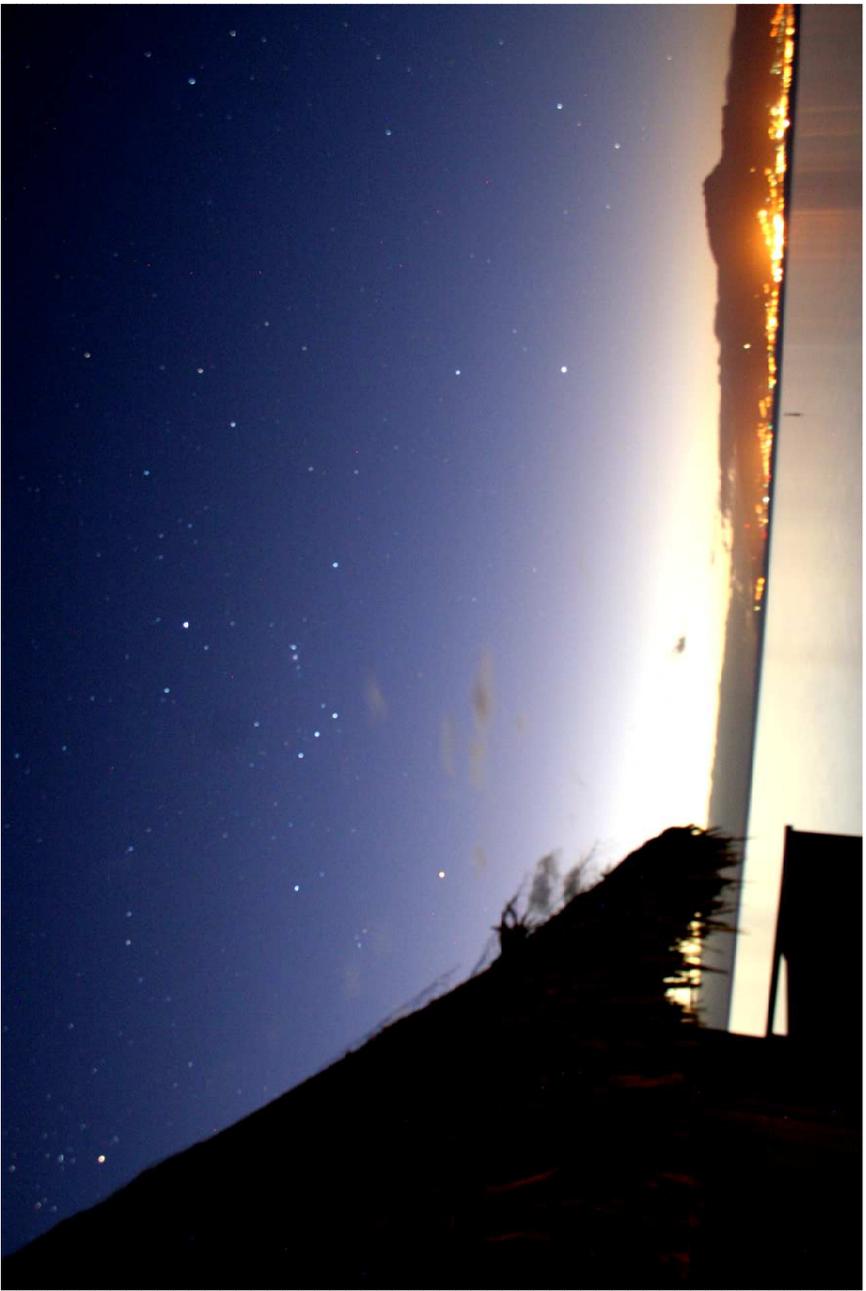
The LAAS does not automatically put anyone on an E-mail list; you have to choose to do it. E-mail is the most efficient way for the board of directors to communicate quickly with the members, and for the members to communicate with each other. We ask all members to join the announcements list, and ask all members to consider joining the general list.

The group is private, and therefore does not come up in a search. To join, send email to: LAAS-subscribe@yahoogroups.com. Include your full name so the moderator can verify your LAAS membership. If approved, you will receive further instructions via email. ✧

Map to Monterey Park Observatory

(The place to build your telescope)





If the sky in the image to the left looks a bit funny to you, it's not you. David Beraru took this image from Easter Island when he briefly visited there to see the July 11th 2010 total solar eclipse. Notice the position and orientation of

Griffith Observatory

Public Star Party Procedure

Before 6:00pm, show your LAAS badge or card to the traffic control person at the fork at the top of Vermont road just before you reach the tunnel. You'll be allowed to drive up East Observatory Ave. After 6:00pm, no one is allowed to drive up East Observatory Ave, and you'll need to drive through the tunnel, up West Observatory Ave., and through the public parking lot to the traffic control person at the end of the lot. Show the person there your badge and they should let you through. Once at the U curve in front of the Observatory, temporarily park your car on the side nearest to the observatory and unload your equipment. Mary Brown will be available with a cart to facilitate moving your equipment. Unload your equipment at the spot where you wish to set up. Mary will oversee your equipment while you park along East Observatory Rd. Then set up your equipment.

Volunteers without equipment are also needed. We especially need help with crowd control with the LAAS 26-inch telescope.

Those who volunteer should remember that the main focus is to be of service to the patrons at Griffith Observatory and show them the nighttime sky. New Members are not expected to adhere to this policy.

Please check the LAAS website and Yahoo group messages for changes and updates in any LAAS event.

To be trained in moving, setting up, and preparing the 26-inch, please attend one of the Griffith public star party events. We normally start setting it up around one hour before sunset, weather permitting. We'd like as many members to be trained and comfortable handling the telescope.

Have fun and enjoy! ✧

PJ Goldfinger & David Nakamoto

Orion, for instance. This was one of the "spectacles" of northern astronomers visiting "The Lands Down Under". By the way, Dave was very lucky to get this image; David Nakamoto reported that during his nights on Easter Island, he only experienced about 30 minutes of clear nights, and all the time it was very windy. This is one of the few images of the night sky he received, and subjectively the best. ✧

2011 Annual Banquet

Here are the current details for the 2011 annual banquet.

Date : Sunday, Jan 23rd, 2011

Time : 5:00pm for the bar
6:00pm for dinner

Location : Monterey Hills Restaurant
3700 Ramona Blvd., Monterey Park
<http://www.montereyhillrestaurant.com/>

Cost : \$45 per person
\$22.50 for children under 13

Mail reservations and checks to :

LAAS Treasurer
P.O. Box 56084
Sherman Oaks, CA 91413

Make checks out to :

Los Angeles Astronomical Society.

On the note line, write **"2011 banquet reservation"**.

See ya there !

LOANER CORNER

Jupiter is currently in the last few months of its viewing season before it slides behind the Sun. Uranus is just north of Jupiter. Saturn won't be making an evening appearance until March, and Mars is about a year away, so now is the time to look at Jupiter and Uranus before they disappear for another year. Many telescopes are available for loan.

For more information call: David Sovereign at (626) 794—0646. ✧

EVENTS CALENDAR

Date	Event	Location and Information
Jan 1st (Sat)	Dark Sky Night	LAAS Lockwood Valley site
Jan 5th (Wed)	Board Meeting	Garvey Ranch Park Class Room. 8:00pm to 10:00pm
Jan 15th (Sat)	Public Star Party	Griffith Observatory, 2:00pm to 10:00pm, See pg 13 for details on Procedures and Rules.
Jan 23rd (Sun)	Annual Banquet	Details on opposite page (pg 14) Speaker not determined
Feb 5th (Sat)	Dark Sky Night	LAAS Lockwood Valley site
Feb 9th (Wed)	Board Meeting	Garvey Ranch Park Class Room. 8:00pm to 10:00pm
Feb 14th (Mon)	General Meeting	Griffith Observatory, Event Horizon Theater, 7:45pm to 9:45pm. No speaker was announced at press time.
Feb 12th (Sat)	Public Star Party	Griffith Observatory, 2:00pm to 10:00pm, See pg 13 for details on



LAAS Home Page: <http://www.laas.org>
 LAAS Bulletin Online: http://www.laas.org/Resources_Newsletter.htm

Sky and Telescope Subscriptions

Sky and Telescope subscriptions renewals should be sent directly to Sky Publishing. To start a Sky & Telescope subscription at club rates, send a check payable to "Sky & Telescope" in the amount of \$32.95 for a one year subscription to :

LAAS treasurer

P.O. Box 56084

Sherman Oaks, CA 91413

Be sure to include the exact name and mailing address for your subscription.

Then thereafter send the renewal bills directly to Sky Publishing. ✧

Astronomy Magazine Subscriptions

For a club rate subscription to **Astronomy**, send a check payable to Kalmbach Publishing Co. in the amount of \$34 for one year or \$60 for two years to the LAAS treasurer at :

LAAS

P.O. Box 56084

Sherman Oaks CA 91413

Be sure to include the exact name and mailing address for your subscription. That magazine also requires later subscription renewals to be handled through the LAAS Treasurer. ✧

Membership Annual Dues:

Youth	\$ 20.00
Regular (18-65)	\$ 45.00
Senior Citizen (65 and up)	\$ 30.00
Senior Family	\$ 40.00
Family	\$ 60.00
Life	\$ 500.00

Additional fees:

Charter Star member	\$ 30.00
Star member, with pad	\$ 70.00
Star member, no pad	\$ 60.00
Printed Bulletin	\$ 15.00

(Membership due date is indicated on the mailing label)

HANDY PHONE LIST



LAAS Answering Machine	(213) 673-7355
Griffith Observatory Program.....	(213) 473-0800
Sky Report.....	unavailable for now
Lockwood Site	(661) 245-2106
(not answered, arrange time with caller. Outgoing calls – collect or calling card)	
Mt. Wilson Institute.....	(626) 793-3100