



# January, 1999

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At the January 8 meeting... (SECOND Friday of January)

## **Dr. Walter Kiefer - Lunar & Planetary Institute.**

**"The View from the Space Telescope: The Solar  
System and Beyond."**

Please see his web site at:

<http://cass.jsc.nasa.gov/science/kiefer/home.html>

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*Houston Astronomical Society*

# **GuideStar**

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**Starline - 281-568-9340**

Houston Astronomical Society presents *Starline* -- a recorded message of Society events and astronomical happenings. This service is updated regularly, so call often to keep up-to-date on Society functions, new comets and more.

**H.A.S. Web Page:** <http://spacsun.rice.edu/~has>

**Schedule Changes & Up-To-Date Information**

See the GuideStar's Monthly Calendar of Events to confirm dates and times of all events for the month, and call Starline for any last minute changes.

**Observatory Site Telephone: 409-732-8967**

# ★★★★★ *The Houston Astronomical Society* ★★★★★★

The Houston Astronomical Society is a non-profit corporation organized under section 501 (C) 3 of the Internal Revenue Code. The Society was formed for education and scientific purposes. All contributions and gifts are deductible for federal income tax purposes. General membership meetings are open to the public and attendance is encouraged.

## ★★★★★ Officers and past president ★★★★★★

President: Don Pearce H: 713-432-0734	Treasurer: Bill Flanagan H: (713) 699-8819
Vice Pres: Kirk Kendrick H: 281-391-3834	Past-President: Allen Gilchrist H: 281-558-1190
Secretary: Matt Delevoryas H: 713-795-0808	

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Jay Levy ..... 281-992-2708	Liaison responsibility
Bill Leach ..... 713-863-8335	Program, Field Trip/Observing
Bill Molinare ..... 713-664-3261	
Bill Pellerin ..... 713-880-8061	
Barbara Wilson ..... 281-933-1289	Observatory Directory
Mike Dye ..... 281-498-1703	

## ★★★★★ Committee Chairpersons ★★★★★★

Audit ..... Orv Wiens ..... 281-391-2995	Program ..... Scott Mitchell ..... 713-461-3020
Education ..... <open>	Publicity ..... Michael Cubstead ..... 713-307-0270
Field Tr./Obsg. .... Kenneth Drake ..... 281-367-1592	Telescope ..... Clayton Jeter ..... 281-383-1337
Novice ..... Sancho/Spore ..... 713-461-3020	Welcoming ..... Marg Nunez ..... 713-529-2549
Observatory ..... Michael Dye ..... 281-498-1703	

## ★★★★★ Ad-Hoc Committee Chairpersons ★★★★★★

Historian ..... Leland Dolan ..... 713-529-0403	Publ. Star Party ..... Marg Nunez ..... 713-529-2549
Librarian ..... Peggy Gilchrist ..... 281-558-1190	Rice U. Coord. .... Matt Delevoryas ..... 713-795-0808
Logo Mds Sales ..... Judy Dye ..... 281-498-1703	Schedule Obs'v'ty ..... Steve Goldberg ..... 713-721-5077
Long Range Plan ..... Don Pearce ..... 713-432-0734	Texas Star Pty ..... Steve Goldberg ..... 713-721-5077
Parliamentarian ..... Kirk Kendrick ..... 281-391-3834	

## ★★★★★ Special Interest Groups & Help Committees ★★★★★★

These are now listed on the inside of GuideStar (not every month). See the Table of Contents

## ★★★★★ Advisors ★★★★★★

Dr. Reginald DuFour, Rice Univ.	Dr. Lawrence Pinsky, U. of H.
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## ★★★★★ Dues and Membership Information ★★★★★★

Annual Dues: Regular .... \$33.00	Student ..... \$5.00
Associate .... \$5.00	Honorary ..... None
Sustaining . \$50.00	

All members have the right to participate in Society functions and to use the Observatory Site. Regular and Student Members receive a subscription to *The Reflector*. Regular, Student, and Honorary Members receive *The GuideStar*. Associate Members, immediate family members of a Regular Member, have all membership rights, but do not receive publications. Sustaining members have the same rights as regular members with the additional dues treated as a donation to the Society. *Sky & Telescope* mag \$27/year, *Astronomy* mag \$29/year -- see club treasurer.

Membership Application: Send funds to address shown on outside cover of *Guidestar*. Attention - Treasurer, along with the following information: Name, Address, Phone Number, Special Interests in Astronomy, Do you own a Telescope? (If so, what kind?), and where you first heard of H.A.S.

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***Call the Starline, 281-568-9340 for updates and changes***

## **Welcome to New Members!**

The Houston Astronomical Society encourages you to join our group of active amateur astronomers and take advantage of the benefits of membership. As a member you'll have access to the club observing site near Columbus, Texas. (You're required to participate in a site orientation meeting before you get the gate lock combination.) The site has concrete pads for setting up your telescope, restroom and bunkhouse facilities, and areas set aside for camping. No new members this month.

## **Special Interest Group Listing**

*Any member who wants specific information on a SIG listed below may call the listed individual. Also, see the "Ad Hoc Committee Chairpersons" on the inside front cover and the "Special Help Volunteers" listing (not in every issue).*

Advanced .....	Bill Flanagan .....	713-699-8819
Comets .....	Kenneth Drake .....	281-367-1592
Lunar & Planetary .....	John Blubaugh .....	713-921-4275
Occultations & Grazes ...	Wayne Hutchison .....	713-827-0828

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## *The President's Message*



As I write this before Christmas, I want to wish everyone in HAS a merry Christmas and a very good, happy, and prosperous New Year. I think that 1998 has been a good year for HAS as we have grown in size, have added telescopes for use at our site, and have had some exceptionally good programs during the year.

Nearing the close of this millennium, I am reminded that it has been my understanding that the projected “dark sky lifetime” of the site was until the year 2000. As we approach this milestone, I think it is safe to say that that projection, fortunately, has not materialized, although it is painfully obvious that we have some serious light pollution to the east and especially northeast. We must continue to work to prevent light pollution from making our site unusable.

With 1999 approaching, I want to thank everyone of you, and you know who you are, who have made HAS “work” Thank you.

Clear skies and le croissant lunaire

*Don Pearce*

# Houston Astronomical Society

*Meeting Notice*

*For Friday, January 8, 1999*

*Second Friday due to*

*New Year's Holiday*

## *Dr. Walter Kiefer*

### *Lunar & Planetary Institute.*

**“The View from the Space Telescope:  
The Solar System and Beyond.”**

Please see his web site at:

<http://cass.jsc.nasa.gov/science/kiefer/home.html>

**Schedule of meeting activities:**

**Novice meeting: ..... 7:00 p.m.**

Jose Sancho and Susan Spore begin a new year of novice programs in January. The Novice program has something for everybody -- novice and experienced observers. Be there!

**Site orientation meeting: ..... 7:00 p.m.**

**General meeting: ..... 8:00 p.m.**

**See the inside back cover for more information.**

# January Calendar:



<i>Date</i>	<i>Time</i>	<i>Event</i>
<b>January</b>		
1	8:51 p.m.	Full Moon
8		HAS Club Meeting
	7:00 p.m.	Novice Presentation - U of H
	8:00 p.m.	General Membership Meeting - U of H
9	8:23 a.m.	Third Quarter Moon
		Members Observatory Night-Columbus
12	7:00 p.m.	Advanced SIG Mtg.-Rice Univ., contact Bill Flanagan, 713-699-8819
16		Prime Night-Columbus
17	9:48 a.m.	New Moon
24	1:17 p.m.	First Quarter Moon
31	10:08 a.m.	Full Moon
<b>February</b>		
5		HAS Club Meeting
	7:00 p.m.	Novice Presentation - U of H
	8:00 p.m.	General Membership Meeting - U of H
6		Members Observatory Night-Columbus
8	6:00 a.m.	Last Quarter
13		Prime Night-Columbus
16	12:41 a.m.	New Moon
	7:00 p.m.	Advanced SIG Mtg.-Rice Univ., contact Bill Flanagan, 713-699-8819
20	TBA	HAS Banquet-Renaissance Houston Hotel, contact Bill Molinare, 713-664-3261
22	8:45 p.m.	First Quarter Moon
23		Venus 0.15 degrees from Jupiter

Send calendar events to [JBlubaugh@aol.com](mailto:JBlubaugh@aol.com) or call 713-921-4275.

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# *Houston Astronomical Almanac – 1999*

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*By Leland A. Dolan*

In previous years, I prepared more extensive almanacs with tables containing the Moon's phases as well as times of the equinoxes and solstices. However, this information is available from other sources, including *The Observer's Handbook*, *Sky & Telescope* and *Astronomy* magazines, as well as from the Internet. Therefore, this article will cover only a few of the more significant events, in detail, visible from the Houston area. When referencing most almanacs, one source of confusion is that most give times of events in Universal Time (UT). Here, I am listing events in either Central Standard Time (CST), or Central Daylight Time (CDT), whichever is in effect on date of event. Daylight Saving Time begins on April 4 1999, Easter Sunday. It ends on October 31, which just happens to be Halloween.

## **Converting from UT to Central Time:**

You will probably need to convert more data from UT to Central Time, than vice versa. Here is something to keep in mind when making these conversions. If the UT hour is less than six (while we are on CST) or five (when on CDT), then you must subtract one day from the UT date, to get the proper date for Houston. Example: The shadow of Europa will egress its transit of Jupiter (move off the Jovian disk) at 1:31 UT on Jan. 4, 1999. We don't want to end up a "minus" hour, so we "borrow" a day of 24 hours. Then we add the 24 hours to the UT hour:  $(24+1=25)$ . Since we are on CST, we subtract 6 hours:  $(25-6=19)$ . Since most clocks do not use 24-hour "military" time, we subtract 12 hours:  $(19-12=7)$ . Of course, the minutes are unchanged. But, what about the date? Remember we borrowed 24 hours? So, we subtract one day, and get 7:31 p.m. CST on Jan. 3, 1999.

## **Partial Lunar Eclipse:**

Of the four eclipses that occur in 1999 the only one visible from Houston is the Partial Lunar eclipse of July 28, which (unfortunately) occurs in brightening morning twilight. The eclipse officially begins with the Moon's entry into the penumbra. However this cannot be detected with the eye. Shortly before the Moon enters the umbra, a darkening "smudge" becomes visible on the Moon's left edge (when viewed with unaided eye or binoculars). The table below lists chronology of events:

*Continued...*

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## *Astronomical Almanac - 1999... from previous page*

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Event	Time CDT	Moon Alt	Sun Alt
Moon enters umbra .....	5:22 a.m. ....	14.5° ....	-15°
Nautical twilight beg. ....	5:41 a.m. ....	11.0° ....	-12°
Mid Eclipse .....	6:34 a.m. ....	1.5° .....	-1°
Sunrise .....	6:39 a.m. ....	0.0° .....	0°

### **The Planets—Mercury:**

Mercury, being the closest planet to the Sun, never ventures beyond twilight, at least for our latitude. It is best seen at either *Greatest E. Elongations*, in the W. sky shortly after sunset (on Mar. 3, Jun. 28, and Oct. 24), or *Greatest W. Elongations*, in the E. sky before sunrise (on Apr. 16, Aug. 14, and Dec. 2). If this is confusing, just remember that if the planet is E. of the Sun, then it sets after the Sun.

### **Venus:**

For the first half of 1999, Venus will be the “Evening Star”. It reaches *Greatest E. Elongation* on Jun. 11, but it soon “plunges” into evening twilight reaching *Greatest Brilliancy* on Jul. 14. On Aug. 20, Venus will be at “*Inferior Conjunction*” with the Sun, at which time it will be invisible. Venus then repeats the previous events (including the its phases) in reverse order in the morning sky, with *Greatest Brilliancy* on Sep. 26, and *Greatest W. Elongation* on Oct. 30.

### **Opposition of Mars:**

The 1999 Opposition of Mars will not be very favorable, but (at least) better than the last one in 1997. Mars is opposite the Sun at intervals of about every 26 months. Since Mars’s orbit is noticeably eccentric, minimum distances at times of oppositions can range from 34.6 million to 63 million miles. This year’s closest approach, which occurs May 1 (exactly a week after opposition) places Mars at 53.8 million miles from Earth, at which time its apparent diameter will be 16.2" (seconds of arc).

### **Outer Planets:**

Dates of oppositions of the outer planets are: Jupiter (Oct. 23), Saturn (Nov. 6), Uranus (Aug. 7), Neptune (Jul. 26), and Pluto (May 30).

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## *Astronomical Almanac - 1999... from previous page*

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### Occultations of First Magnitude "Stars":

As seen from Houston in 1999, there will be many occultations of faint stars, but only three of "first magnitude" objects. These include one each occultation of *Aldebaran* and *Regulus*, and for those who want a challenge, the reappearance of Mars (about midday) from behind the rising Moon. This latter will require a low horizon and very clear skies. Fortunately, it will occur on a Sunday. In the following table the "D/R" column indicates Disappearance or Reappearance. Note, in the case of *Regulus*, that the star disappears on Friday evening, and reappears after Midnight on Saturday morning. Keep in mind that the times are approximate, and will vary according to your location.

Date	Star	Time	D/R	Alt.
Jan 27 .....	Aldebaran ....	2:04 a.m. CST .....	D .....	14°
May 21 .....	Regulus .....	11:32 p.m. CDT .....	D .....	32°
May 22 .....	.....	12:25 a.m. CDT .....	R .....	20°
Dec 12 .....	Mars .....	11:37 a.m. CST .....	R .....	11°

The information in this article is not guaranteed free of errors, but has been checked to eliminate major mistakes. I hope it proves useful under the stars. Happy Observing!

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## *Thanks to GuideStar Contributors*

by *Bill Pellerin, GuideStar editor*

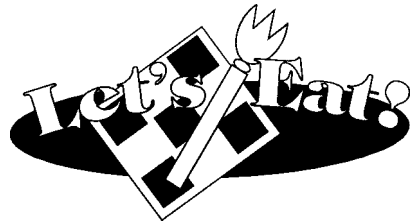
As we begin a new year, my thanks go to those of you who helped provide meaningful content for the *GuideStar*. Matt Delevoryas contributes his "B&Ps from the IAUCs", comet material, lunar occultation information, and meeting minutes; John Blubaugh provides the Monthly Calendar to keep you up-to-date on Society and celestial events; Leland Dolan has contributed several technical articles describing astronomical events; Mike Dye (in addition to his other responsibilities) contributes the "Observatory Corner" and the "Observatory Duty List"; Scott Mitchell has made several contributions to the *GuideStar*. Don Pearce provides our monthly "President's Message"; and Ken Drake has contributed information on comets visible in the night sky.

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# *HAS Annual Banquet —Coming in February*

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The *Houston Astronomical Society* presents our annual banquet, to be held on the evening of Saturday, February 20, 1999 at the Renaissance Houston Hotel (formerly Stouffer's). This hotel is centrally located along the Southwest Freeway in Greenway Plaza, next to "The Summit". a.k.a. Compaq Center.



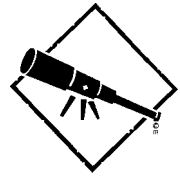
Accommodations will be in the Plaza Room, on the 20<sup>th</sup> floor, which features floor to ceiling windows offering a spectacular view of the City at night. Cocktails will be served at the adjacent "City Lights" lounge. The *Renaissance* is renowned for its fine cuisine.

Our featured speaker will be Dr. John H. Lienhard, Professor of Engineering at the University of Houston. Dr. Lienhard is well known for his ability to explain technology in words that that ordinary people can understand. His series "Engines of our Ingenuity" is carried on radio stations across the country.

A sign-up form is included in printed copies of the *GuideStar*.

For information, call Bill Molinare at (713) 664-3261.

# Observatory Corner



By Michael B. Dye Observatory Chairman



As I write this article for the January *GuideStar*, it is about 6 days after the meeting and still about fifteen days before Christmas. I am trying to pull an article out of the air along with having to find enough time to complete preparations for two trips on two consecutive weekends, get ready for Christmas and work three different HOT jobs at work. Sometimes I have more fun than I can stand. Anyway here goes the article.

This article will be more or less a review of what was accomplished at the Observatory Site last (1998) year and what I hope to accomplish this (1999) year. The first thing to address is the annual list of good viewing nights (weather excepted) at the Observatory Site. I used Matt Delevoryas list that can be found at the HAS web site for selecting the Prime Nights and Member Observatory Nights. Included in this list are the New and Full Moon dates. I hope this list helps members select dates to go and use the Observatory Site.

<i>Month</i>	<i>Prime Night</i>	<i>Members Observatory Night</i>	<i>New Moon</i>	<i>Full Moon</i>
January .....	16 .....	9 .....	17 .....	1 & 31
February .....	13 .....	6 .....	16 .....	None
March .....	13 .....	6 .....	17 .....	2 & 31
April .....	10 .....	17 .....	15 .....	30
May .....	15 .....	8 .....	15 .....	30
June .....	12 .....	5 .....	13 .....	28
July .....	10 .....	3 .....	12 .....	28
August .....	7 .....	28 .....	11 .....	26
September .....	4 .....	11 .....	9 .....	25
October .....	9 .....	2 .....	9 .....	24
November .....	6 .....	13 .....	7 .....	23
December .....	4 .....	11 .....	7 .....	22

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## Observatory Corner... from previous page

There were four major projects that the Observatory Committee worked on in 1998. The projects were as follows:

- (1) Complete the New building being erected South of the Observatory Parking Lot. Said building will be used to store the as yet unnamed 12 1/2" Dobsonian which was donated to the Observatory Site last year. Also to safely store various Society records now currently stored in the respective houses of the members in charge of same (the records, not the houses).
- (2) Work on member use rules/guidelines and a name for the unnamed 12 1/2" Dobsonian scope.
- (3) Have a Fund raising campaign for new Capital Improvement projects and to build up the unscheduled maintenance fund.
- (4) Change the Observatory Site combination about July. The Combination has become somewhat compromised in the last few years. Also it has been three years sense I last changed it. The normal limit is two years.

Item number 1 was accomplished and even had a bonus in that a new member donated another 12.5 inch Dob to be used at the Observatory Site. The new building now houses two Dobsonians for member use. Call Steve Goldberg (number listed as Telescope Scheduler in *GuideStar*). Previous experience on use of an Dobsonian Telescope would be nice. Also one should bring ones own eyepieces as we have not had time to get any yet.

Item number 2 was almost accomplished. I got some good guidelines and questions from Matt and then dropped the ball. Still working and intend to have the information in Steve Goldberg hands by the time someone calls him. I need to note that the Dobsonian telescopes are for member use only. It looks like the names are going to be Observatory Site Dob Number One and Number Two.

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## ***Observatory Corner... from previous page***

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The last two items worked out very well. We raised about \$4,522.00 for use as capital Improvements and repairs at the Observatory Site. I would like to thank everyone who contributed this year and in years past. As usual I will be sending out Contribution Receipt's by January 31st. The Combination change also went well. I still have some holes in my records that indicate some people have not had Observatory Site Orientation when in fact they had. I am still trying to correct these problems as they occur.

I would also like to take this occasion to thank all the members of the 1998 Observatory Committee for all the help they gave the committee in 1998.

As of this date, I plan to have the 1999 Observatory Committee organizational meeting at the Observatory Site on the second weekend of January, most likely on Saturday. I invite any member who is interested to attend this meeting. More information about the time will be given at the January General Membership meeting.

The one thing I was not able to accomplish this year was my annual report (list) of the hours spent at the Observatory Site by various members as compiled from the 1997 Pad Log Forms. I still intend to try and get this activity done, but as this is a time permitting activity, it may still be delayed even more. Also one other thing about the members who spend over 100 hours at the Observatory (observing or working). There is not any award or certificate that goes with this notoriety. All one gets is having ones name listed in the Observatory Corner article along with the number of hours spent at the Observatory Site.

***Please fill out the appropriate log form  
when you use the site.***

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# *1999 Columbus Sunrise/Sunset, Twilight, and Moonrise/Moonset*

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*by Matt Delevoryas*

As announced at the September and later meetings of the Society, there are now available two tables, one giving the 1999 sunrise, sunset, and twilight, and one giving the 1999 moonrise and moonset times, calculated for the Society's Columbus observatory site. Traditionally these have been made available on opposite faces of paper copies distributed at Society meetings late in the year. This is being done as usual, but the tables are also temporarily available in electronic form.

The sun table gives phenomena for every other day of the year, and the moon table gives phenomena for every day of the year. Since Society members are most interested in information about when it is dark in Columbus on just Saturday nights/Sunday mornings, appropriate information was extracted from these tables and made available through the HAS Web site (<http://spacsun.rice.edu/~has>). However, the original complete tables are also available in several different electronic forms

sun: <http://users.aol.com/MDelevorya/c99sun.htm>

moon: <http://users.aol.com/MDelevorya/c99moon.htm>.

However, these are only temporary. If you think it would be valuable to have any of those tables available permanently on the HAS Web site, please say so to Steve Goldberg, [goldberg@sccsi.com](mailto:goldberg@sccsi.com) (or to me, [MDelevorya@aol.com](mailto:MDelevorya@aol.com)).

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## *Other Meetings...*

**Brazosport Astronomy Society** meets at 7:00 p.m. on the 2nd Thursday of each month in the Planetarium of the fine Arts Center at Brazosport College. Call Steve Lamb for program details (409) 297-3984

**Fort Bend Astronomy Club** meets the third Friday of the month at 8:00 p.m. at the First Colony conference Center. Novice meeting begins at 7:00, regular meeting begins at 8:00. Web site: <http://rampages.onramp.net/~binder/>

**Johnson Space Center Astronomical Society** meets in the the Lunar and Planetary Institute on the 2nd Friday of each month. Web site: <http://www.ghgcorp.com/cbr/jscas.html>

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## *HAS Web Page*

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The Houston Astronomical Society Web page has information on the society, its resources, and meeting information.

The address is: <http://spacsun.rice.edu/~has>

Want your astronomy work and name on the Internet for the whole world to see? Have some neat equipment? Pictures in film, CCD, hand drawings or video format are all welcome on the page. Do you have an idea to improve the page? I'm listening. Send me Email at [goldberg@sccsi.com](mailto:goldberg@sccsi.com). (You can click on my name on the HAS home page). Or, you can call me, Steve Goldberg (WebMaster), at 713-721-5077.

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## *B&Ps from the IAUCs*

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by Matt Delevoryas



*GuideStar* (last May pp. 9-10, 1996 May p. 8 and April pp. 8, 10), brought you news of a very unusual variable star, Sakurai's object. In the meantime, it also acquired a more pedestrian designation, V4334 Sagittarii. The star, an aged main sequence star surrounded by an old planetary nebula, is believed to be approaching its helium flash — it has started burning helium to carbon at its core, and is approaching a moment when temperatures will support a very short-lived phase of widespread helium burning, with an accompanying brightening. Some models show this behavior taking much longer than was suggested by a couple of other (poorly observed) stellar outbursts with related nebulae. V4334 Sgr is the first good opportunity to watch the phenomenon from the start. So, is Sakurai's object back in the news? In June, IAU Circular 6952 reported March and May infrared spectroscopy consistent with thermal radiation from a shell of hot dust, presumably carbon-rich grains. This was hardly surprising news, but reassuring. However, IAUC 7049 reported a “dramatic fading due to dust formation,” taking it from magnitude 12.1 in early August to 14.1 in late August, and 15.2 in early November. IAUC 7065 suggested that in November the dust shell might have become detached from the star. Its photoelectric color indexes show much reddening. The bad news is that the dramatic fading which makes it so interesting and so worth watching at this time has also put it outside the range of many of us! However, it can't stay this faint, and nobody knows when that will change, so it may be worth watching just to see when you can see it again! Finder charts are still available by arrangement with this author (see inside cover for phone numbers).

IAUC 7046 reports a case of astronomical mistaken identity. The MACHO (MAssive Compact Halo Object) Collaboration intensively searches stars in the Magellanic Clouds for anomalous brightenings which might be caused by gravitational microlensing due to dark but

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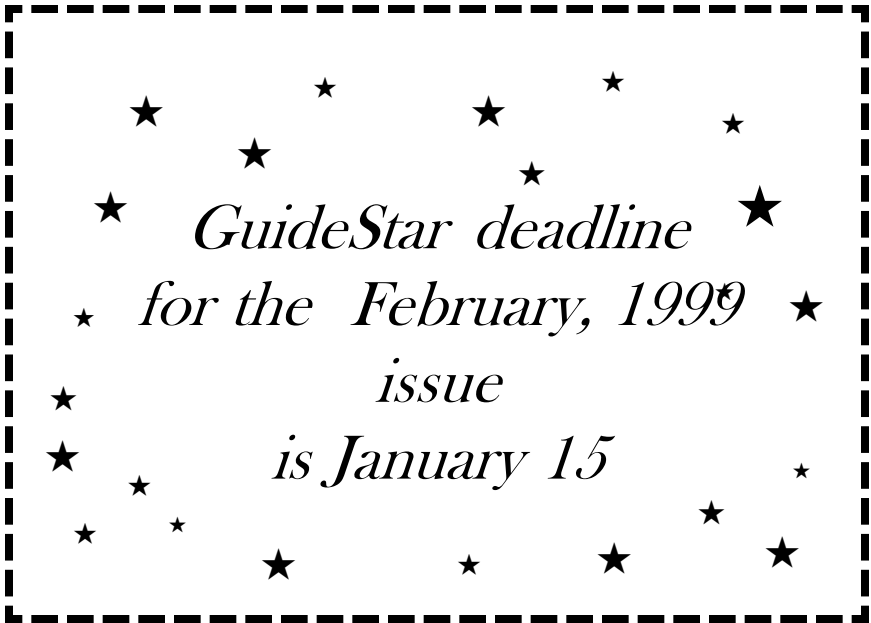
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***B&Ps from the IAUCS.... from previous page***

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heavy objects surrounding our own galaxy. (See September *GuideStar*, pp. 13-14.) They recently observed what appeared to be the onset of one of these events, and issued MACHO Alert 98-LMC-4. However, further research showed that it is not a lensing event. The star is not even a star in the Large Magellanic Cloud! It is at the edge of a galaxy lying behind the LMC, GH 9-2 (Gurwell and Hodge, 1990, *PASP* 102, 849). What seemed to be a lensed star a small fraction of a megaparsec away now seems to be a supernova in a galaxy many, many megaparsecs away, Supernova 1998er.

Last month's article (pp. 14-15) reported the fading of archetypical variable star R Coronae Borealis. The IAUCs have been silent, but other reports indicate it finally rose a magnitude (from its plateau between magnitudes 8.0 and 8.5) in the first ten days of December. This behavior usually indicates returning to maximum light. Listen to Starline for any changes from this magnitude. See last month for information about charts, go to [http://charts.aavso.org/charts/CRB/R\\_CRB/](http://charts.aavso.org/charts/CRB/R_CRB/), or contact this author.



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# Observatory Duty Roster

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by Michael B. Dye, Observatory Chairman

This is the duty list for January, February, and March. Be sure to contact your supervisor for any information that you may need and the date and time to be at the site. You may change from site duty to open house or from open house to site duty by pre-arrangement with the Site Supervisor for that month. Changes between months require Observatory Chairman coordination.

**For January supervisor ..... Kirk Kendrick ..... 281 391-3834**  
Michael Pennington ..... Members Observatory Night 01-16-99  
Michael D. Peters ..... Site  
Sim Picheloup ..... Members Observatory Night 01-16-99  
Gary Ray ..... Members Observatory Night 01-16-99  
Glenn L. Ray ..... Site  
George E. E. Reder, II ..... Site  
Mike Reynolds ..... Site  
Henry Schneider ..... Site

**For February supervisor ..... Robert Rogers ..... 281 997-9682**  
Carl Sexton ..... Site  
Steve Simpson ..... Site  
Larry C. Wadle ..... Site  
Mark R. Watson ..... Members Observatory Night 02-13-99  
Tom Williams ..... Site  
Barbara Wilson ..... Members Observatory Night 02-13-99  
Buster Wilson ..... Members Observatory Night 02-13-99  
Warren Wundt ..... Site

**For March supervisor ..... Robert Rogers ..... 281 997-9682**  
W. Charles Barns ..... Members Observatory Night 03-13-99  
Don Bates ..... Site  
John Blubaugh ..... Site  
Ken Carey ..... Members Observatory Night 03-13-99  
Ronald R. Carman ..... Site  
John Chauvin ..... Site  
Art Ciampi ..... Members Observatory Night 03-13-99  
Mickey Davis ..... Site

Please remember that Site work can be done anytime and does not have to be done just before Members Observatory Night. Contact your Site Supervisor for details. Names are selected for Site Duty using the current Alphabetical listing for Observatory Key Holders. If any member knows of a conflict please call me before your name is listed.

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# Comet 21P/Giacobini-Zinner

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by Matt Delevoryas

Following is an ephemeris for Comet 21P/Giacobini-Zinner, brought to you by the folks at Starline, with information provided by the IAU Circulars Committee. The IAU Circulars indicate that this dependable comet, formerly running a little brighter than predictions, now has brightness exactly on track. During the ephemeris, it is a low west-southwesterly evening object crossing Cetus from Aquarius to Eridanus. The elements are from MPC 25184, and the magnitude was originally taken from the 1991 Comet Handbook and agrees with many later sources. For elements, contact the Committee. For additional ephemerides, please contact Kenneth Drake, the Chairman of the HAS Comet SIG. The columns C-E and C-S give the comet-Earth and comet-Sun distances in a.u., and each line is for 0<sup>h</sup> UTC.

Date	Julian	J2000.0			B1950.0			Mag	C-E	C-S
		RA	Dec		RA	Dec				
mmm dd	Date	h m	deg mi	h m	deg mi	Mag	C-E	C-S		
Dec 27	2451174.5	23 44.3	-23 58	23 41.7	-24 14	9.8	0.96	1.15		
Dec 29	2451176.5	23 54.5	-24 00	23 51.9	-24 16	9.9	0.97	1.16		
Dec 31	2451178.5	0 04.5	-23 59	0 01.9	-24 15	10.0	0.98	1.17		
Jan 2	2451180.5	0 14.3	-23 55	0 11.8	-24 11	10.1	1.00	1.19		
Jan 4	2451182.5	0 24.0	-23 48	0 21.4	-24 05	10.2	1.01	1.20		
Jan 6	2451184.5	0 33.4	-23 39	0 30.9	-23 56	10.3	1.03	1.21		
Jan 8	2451186.5	0 42.6	-23 28	0 40.2	-23 44	10.4	1.05	1.23		
Jan 10	2451188.5	0 51.7	-23 14	0 49.2	-23 30	10.6	1.06	1.24		
Jan 12	2451190.5	1 00.5	-22 58	0 58.1	-23 15	10.7	1.08	1.26		
Jan 14	2451192.5	1 09.2	-22 41	1 06.7	-22 57	10.8	1.10	1.27		
Jan 16	2451194.5	1 17.6	-22 22	1 15.2	-22 38	10.9	1.12	1.29		
Jan 18	2451196.5	1 25.9	-22 01	1 23.5	-22 17	11.0	1.14	1.30		
Jan 20	2451198.5	1 34.0	-21 39	1 31.6	-21 55	11.1	1.16	1.32		
Jan 22	2451200.5	1 41.9	-21 16	1 39.5	-21 31	11.2	1.18	1.34		
Jan 24	2451202.5	1 49.6	-20 52	1 47.2	-21 07	11.4	1.20	1.35		
Jan 26	2451204.5	1 57.1	-20 26	1 54.8	-20 41	11.5	1.22	1.37		
Jan 28	2451206.5	2 04.5	-20 00	2 02.1	-20 15	11.6	1.25	1.39		
Jan 30	2451208.5	2 11.7	-19 34	2 09.4	-19 48	11.7	1.27	1.40		
Feb 1	2451210.5	2 18.8	-19 06	2 16.4	-19 20	11.8	1.29	1.42		
Feb 3	2451212.5	2 25.7	-18 39	2 23.4	-18 52	12.0	1.32	1.44		
Feb 5	2451214.5	2 32.5	-18 10	2 30.1	-18 24	12.1	1.34	1.45		

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# Comet P/1998 U3 Jager

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by Matt Delevoryas

Following is an ephemeris for Comet P/1998 U3 Jager, brought to you by the folks at Starline, with information provided by the IAU Circulares Committee. During the ephemeris, it transits at the zenith around midnight, in Auriga. The elements are from MPC 32866, and the magnitude follows IAU Circular 7040. For elements, contact the Committee. For additional ephemerides, please contact Kenneth Drake, the Chairman of the HAS Comet SIG. The columns C-E and C-S give the comet-Earth and comet-Sun distances in a.u., and each line is for 0<sup>h</sup> UTC.

Date	Julian	J2000.0				B1950.0				Mag	C-E	C-S
		RA		Dec		RA		Dec				
mmm dd	Date	h	m	deg	mi	h	m	deg	mi			
Dec 27	2451174.5	6	43.2	+38	40	6	39.8	+38	43	10.6	1.29	2.25
Dec 29	2451176.5	6	41.4	+38	22	6	38.0	+38	25	10.6	1.28	2.25
Dec 31	2451178.5	6	39.6	+38	02	6	36.2	+38	05	10.5	1.28	2.24
Jan 2	2451180.5	6	37.8	+37	42	6	34.4	+37	44	10.5	1.27	2.24
Jan 4	2451182.5	6	36.1	+37	20	6	32.7	+37	22	10.5	1.27	2.23
Jan 6	2451184.5	6	34.3	+36	57	6	30.9	+37	00	10.5	1.27	2.23
Jan 8	2451186.5	6	32.6	+36	34	6	29.2	+36	36	10.5	1.26	2.22
Jan 10	2451188.5	6	30.9	+36	09	6	27.6	+36	11	10.5	1.26	2.22
Jan 12	2451190.5	6	29.3	+35	44	6	26.0	+35	46	10.5	1.26	2.21
Jan 14	2451192.5	6	27.8	+35	18	6	24.5	+35	20	10.5	1.26	2.21
Jan 16	2451194.5	6	26.4	+34	51	6	23.1	+34	53	10.4	1.27	2.21
Jan 18	2451196.5	6	25.1	+34	24	6	21.8	+34	26	10.4	1.27	2.20
Jan 20	2451198.5	6	23.9	+33	56	6	20.6	+33	58	10.4	1.27	2.20
Jan 22	2451200.5	6	22.8	+33	28	6	19.5	+33	30	10.4	1.28	2.19
Jan 24	2451202.5	6	21.8	+33	00	6	18.6	+33	01	10.4	1.28	2.19
Jan 26	2451204.5	6	21.0	+32	31	6	17.7	+32	33	10.5	1.29	2.19
Jan 28	2451206.5	6	20.3	+32	02	6	17.1	+32	04	10.5	1.30	2.18
Jan 30	2451208.5	6	19.8	+31	34	6	16.5	+31	35	10.5	1.31	2.18
Feb 1	2451210.5	6	19.4	+31	05	6	16.1	+31	06	10.5	1.32	2.18
Feb 3	2451212.5	6	19.1	+30	36	6	15.9	+30	37	10.5	1.33	2.17
Feb 5	2451214.5	6	19.0	+30	07	6	15.8	+30	09	10.5	1.34	2.17

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# Comet C/1998 M5 LINEAR

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by Matt Delevoryas

Following is an ephemeris for Comet C/1998 M5 LINEAR, brought to you by the folks at Starline, with information provided by the IAU Circulars Committee. During the ephemeris, it is a northwesterly evening object becoming a northeasterly morning object, mostly in Lyra but ending up in Draco and Cygnus. The elements are from MPC 34210, and the magnitude follows MPC 32356. For elements, contact the Committee. For additional ephemerides, please contact Kenneth Drake, the Chairman of the HAS Comet SIG. The columns C-E and C-S give the comet-Earth and comet-Sun distances in a.u., and each line is for 0<sup>h</sup> UTC.

Date mmm dd	Julian Date	J2000.0			B1950.0			Mag	C-E	C-S
		RA h m	Dec deg mi	RA h m	Dec deg mi					
Dec 27	2451174.5	18 54.0	+40 03 18	52.3	+40 00 10.0	1.98	1.78			
Dec 29	2451176.5	18 55.0	+40 32 18	53.3	+40 28 10.0	1.97	1.78			
Dec 31	2451178.5	18 56.0	+41 02 18	54.4	+40 58 9.9	1.96	1.77			
Jan 2	2451180.5	18 57.1	+41 34 18	55.4	+41 30 9.9	1.95	1.77			
Jan 4	2451182.5	18 58.2	+42 08 18	56.6	+42 04 9.9	1.94	1.76			
Jan 6	2451184.5	18 59.3	+42 44 18	57.7	+42 40 9.9	1.93	1.76			
Jan 8	2451186.5	19 00.5	+43 22 18	58.9	+43 18 9.9	1.91	1.76			
Jan 10	2451188.5	19 01.7	+44 02 19	00.2	+43 58 9.8	1.90	1.75			
Jan 12	2451190.5	19 02.9	+44 45 19	01.4	+44 40 9.8	1.89	1.75			
Jan 14	2451192.5	19 04.2	+45 30 19	02.7	+45 25 9.8	1.87	1.75			
Jan 16	2451194.5	19 05.5	+46 17 19	04.1	+46 12 9.8	1.86	1.75			
Jan 18	2451196.5	19 06.8	+47 06 19	05.4	+47 01 9.7	1.84	1.74			
Jan 20	2451198.5	19 08.2	+47 58 19	06.8	+47 53 9.7	1.82	1.74			
Jan 22	2451200.5	19 09.6	+48 53 19	08.2	+48 48 9.7	1.81	1.74			
Jan 24	2451202.5	19 11.0	+49 50 19	09.7	+49 45 9.7	1.79	1.74			
Jan 26	2451204.5	19 12.4	+50 50 19	11.1	+50 45 9.7	1.78	1.74			
Jan 28	2451206.5	19 13.9	+51 53 19	12.6	+51 48 9.6	1.76	1.74			
Jan 30	2451208.5	19 15.3	+52 59 19	14.2	+52 53 9.6	1.74	1.74			
Feb 1	2451210.5	19 16.8	+54 07 19	15.7	+54 02 9.6	1.73	1.74			
Feb 3	2451212.5	19 18.4	+55 19 19	17.3	+55 13 9.6	1.71	1.75			
Feb 5	2451214.5	19 19.9	+56 34 19	18.9	+56 28 9.6	1.69	1.75			

# Comet C/1998 U5 LINEAR

by *Matt Delevoryas*

Following is an ephemeris for Comet C/1998 U5 LINEAR, brought to you by the folks at Starline, with information provided by the IAU Circulars Committee. During the ephemeris, it is a westerly evening object moving toward the sunset (and becoming lost some time around month end), in Pegasus entering Delphinus on the night of the 10th/11th. The elements are from MPC 32866, and the magnitude follows IAU Circular 7059. For elements, contact the Committee. For additional ephemerides, please contact Kenneth Drake, the Chairman of the HAS Comet SIG. The columns C-E and C-S give the comet-Earth and comet-Sun distances in a.u., and each line is for 0<sup>h</sup> UTC.

Date	Julian Date	J2000.0				B1950.0				Mag	C-E	C-S
		RA	Dec	RA	Dec							
mmm dd		h	m	deg	mi	h	m	deg	mi			
Dec 27	2451174.5	21	13.6	+19 08	21	11.3	+18 55	9.7	1.40	1.24		
Dec 29	2451176.5	21	12.7	+18 33	21	10.4	+18 21	9.8	1.45	1.24		
Dec 31	2451178.5	21	11.8	+18 02	21	09.5	+17 50	9.8	1.51	1.25		
Jan 2	2451180.5	21	11.1	+17 34	21	08.8	+17 22	9.9	1.56	1.25		
Jan 4	2451182.5	21	10.5	+17 08	21	08.1	+16 56	10.0	1.60	1.26		
Jan 6	2451184.5	21	09.9	+16 45	21	07.6	+16 33	10.1	1.65	1.26		
Jan 8	2451186.5	21	09.5	+16 23	21	07.1	+16 11	10.2	1.70	1.27		
Jan 10	2451188.5	21	09.0	+16 04	21	06.7	+15 52	10.3	1.74	1.27		
Jan 12	2451190.5	21	08.7	+15 46	21	06.4	+15 34	10.3	1.79	1.28		
Jan 14	2451192.5	21	08.4	+15 30	21	06.1	+15 18	10.4	1.83	1.29		
Jan 16	2451194.5	21	08.2	+15 15	21	05.8	+15 03	10.5	1.87	1.30		
Jan 18	2451196.5	21	07.9	+15 01	21	05.6	+14 49	10.6	1.91	1.31		
Jan 20	2451198.5	21	07.8	+14 49	21	05.4	+14 37	10.6	1.94	1.32		
Jan 22	2451200.5	21	07.6	+14 38	21	05.2	+14 26	10.7	1.98	1.33		
Jan 24	2451202.5	21	07.5	+14 28	21	05.1	+14 16	10.8	2.01	1.34		
Jan 26	2451204.5	21	07.4	+14 19	21	05.0	+14 07	10.9	2.05	1.35		
Jan 28	2451206.5	21	07.3	+14 11	21	04.9	+13 59	10.9	2.08	1.37		
Jan 30	2451208.5	21	07.2	+14 04	21	04.8	+13 52	11.0	2.11	1.38		
Feb 1	2451210.5	21	07.1	+13 58	21	04.7	+13 46	11.1	2.14	1.39		

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# Comet C/1998 P1 Williams

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by Matt Delevoryas

Following is an ephemeris for Comet C/1998 P1 Williams, brought to you by the folks at Starline, with information provided by the IAU Circulares Committee. During the ephemeris, it starts as a south-southeasterly morning object, but shortly thereafter it begins transiting high in the south during the early morning, in Virgo for the first most of February, then Leo followed by Leo Minor. Do not confuse Williams with any of the many galaxies it passes. The elements are from MPC 32595, and the magnitude follows IAU Circular 7042. For elements, contact the Committee. For additional ephemerides, please contact Kenneth Drake, the Chairman of the HAS Comet SIG. The columns C-E and C-S give the comet-Earth and comet- Sun distances in a.u., and each line is for 0<sup>h</sup> UTC.

Date	Julian	J2000.0			B1950.0			Mag	C-E	C-S
		RA	Dec	RA	Dec					
mmm dd	Date	h m	deg mi	h m	deg mi	deg mi	deg mi			
Dec 28	2451175.5	12 54.6	-06 57	12 52.0	-06 41	10.3	1.42	1.59		
Dec 29	2451176.5	12 53.0	-06 24	12 50.4	-06 08	10.3	1.40	1.60		
Dec 30	2451177.5	12 51.3	-05 49	12 48.7	-05 33	10.3	1.39	1.61		
Dec 31	2451178.5	12 49.5	-05 14	12 47.0	-04 58	10.3	1.37	1.62		
<u>Jan 1</u>	<u>2451179.5</u>	<u>12 47.7</u>	<u>-04 37</u>	<u>12 45.1</u>	<u>-04 21</u>	<u>10.3</u>	<u>1.35</u>	<u>1.63</u>		
Jan 2	2451180.5	12 45.8	-03 59	12 43.2	-03 43	10.3	1.33	1.64		
Jan 3	2451181.5	12 43.7	-03 20	12 41.2	-03 04	10.3	1.32	1.66		
Jan 4	2451182.5	12 41.6	-02 40	12 39.1	-02 23	10.3	1.30	1.67		
Jan 5	2451183.5	12 39.4	-01 58	12 36.9	-01 41	10.3	1.28	1.68		
<u>Jan 6</u>	<u>2451184.5</u>	<u>12 37.1</u>	<u>-01 15</u>	<u>12 34.6</u>	<u>-00 58</u>	<u>10.3</u>	<u>1.27</u>	<u>1.69</u>		
Jan 7	2451185.5	12 34.7	-00 30	12 32.2	-00 14	10.3	1.25	1.70		
Jan 8	2451186.5	12 32.3	+00 15	12 29.7	+00 32	10.3	1.24	1.71		
Jan 9	2451187.5	12 29.7	+01 03	12 27.1	+01 19	10.3	1.22	1.72		
Jan 10	2451188.5	12 27.0	+01 51	12 24.4	+02 08	10.3	1.21	1.73		
<u>Jan 11</u>	<u>2451189.5</u>	<u>12 24.1</u>	<u>+02 41</u>	<u>12 21.6</u>	<u>+02 58</u>	<u>10.3</u>	<u>1.19</u>	<u>1.74</u>		
Jan 12	2451190.5	12 21.2	+03 33	12 18.6	+03 50	10.3	1.18	1.75		
Jan 13	2451191.5	12 18.1	+04 26	12 15.6	+04 42	10.3	1.17	1.76		
Jan 14	2451192.5	12 15.0	+05 20	12 12.4	+05 37	10.3	1.15	1.77		
Jan 15	2451193.5	12 11.7	+06 16	12 09.1	+06 33	10.3	1.14	1.78		
<u>Jan 16</u>	<u>2451194.5</u>	<u>12 08.3</u>	<u>+07 13</u>	<u>12 05.7</u>	<u>+07 30</u>	<u>10.3</u>	<u>1.13</u>	<u>1.79</u>		
Jan 17	2451195.5	12 04.7	+08 12	12 02.1	+08 28	10.3	1.12	1.81		
Jan 18	2451196.5	12 01.0	+09 11	11 58.4	+09 28	10.3	1.11	1.82		
Jan 19	2451197.5	11 57.2	+10 12	11 54.6	+10 29	10.3	1.10	1.83		

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## *Comet Williams... from previous page*

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Jan 20	2451198.5	11	53.2	+11	14	11	50.7	+11	31	10.3	1.09	1.84
<u>Jan 21</u>	<u>2451199.5</u>	<u>11</u>	<u>49.1</u>	<u>+12</u>	<u>17</u>	<u>11</u>	<u>46.6</u>	<u>+12</u>	<u>34</u>	<u>10.3</u>	<u>1.08</u>	<u>1.85</u>
Jan 22	2451200.5	11	44.9	+13	21	11	42.3	+13	38	10.3	1.07	1.86
Jan 23	2451201.5	11	40.5	+14	26	11	37.9	+14	42	10.4	1.07	1.87
Jan 24	2451202.5	11	36.0	+15	31	11	33.4	+15	47	10.4	1.06	1.88
Jan 25	2451203.5	11	31.4	+16	36	11	28.8	+16	53	10.4	1.06	1.89
<u>Jan 26</u>	<u>2451204.5</u>	<u>11</u>	<u>26.6</u>	<u>+17</u>	<u>42</u>	<u>11</u>	<u>24.0</u>	<u>+17</u>	<u>59</u>	<u>10.4</u>	<u>1.05</u>	<u>1.90</u>
Jan 27	2451205.5	11	21.7	+18	48	11	19.1	+19	04	10.4	1.05	1.92
Jan 28	2451206.5	11	16.7	+19	54	11	14.0	+20	10	10.4	1.05	1.93
Jan 29	2451207.5	11	11.5	+20	59	11	08.9	+21	16	10.5	1.05	1.94
Jan 30	2451208.5	11	06.3	+22	04	11	03.6	+22	20	10.5	1.05	1.95
<u>Jan 31</u>	<u>2451209.5</u>	<u>11</u>	<u>00.9</u>	<u>+23</u>	<u>08</u>	<u>10</u>	<u>58.2</u>	<u>+23</u>	<u>24</u>	<u>10.5</u>	<u>1.05</u>	<u>1.96</u>
Feb 1	2451210.5	10	55.4	+24	11	10	52.7	+24	27	10.6	1.05	1.97
Feb 2	2451211.5	10	49.9	+25	14	10	47.1	+25	29	10.6	1.05	1.98
Feb 3	2451212.5	10	44.2	+26	14	10	41.5	+26	30	10.6	1.06	1.99
Feb 4	2451213.5	10	38.5	+27	14	10	35.7	+27	29	10.7	1.06	2.01
<u>Feb 5</u>	<u>2451214.5</u>	<u>10</u>	<u>32.7</u>	<u>+28</u>	<u>11</u>	<u>10</u>	<u>29.9</u>	<u>+28</u>	<u>27</u>	<u>10.7</u>	<u>1.07</u>	<u>2.02</u>
Feb 6	2451215.5	10	26.9	+29	07	10	24.1	+29	22	10.7	1.08	2.03

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## *Novice Program*

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Scott Mitchell and Amelia Goldberg completed their duties as Novice Chairpersons at the December 1998 meeting. Scott and Amelia have made a significant contribution to the membership by their efforts. They developed effective and interesting programs for the membership and their presentations were well received. Their sky simulator and their telescope simulators are an outstanding example of their efforts. This program was re-presented at TSP.



Amelia & Scott

In addition, Amelia, working with Barbara Wilson (previous co-chair of the Novice Program) developed the "Universe Sampler", an introduction to skywatching for the novice. This outstanding program has now been adopted by other organizations.



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# Special "Help" Volunteers

Any member who wants specific information on a subject listed below may call the individual listed. If you have a moderate knowledge of a special subject and would be happy to have others ask you about that subject, let the editor know and your subject, name and phone will be listed in *GuideStar* in the future. Note that we have listed a few possible areas where you might volunteer, but, of course, you are not limited to these. You can also have a specialty which is a sub-group of another. Note that the number of names for any subject is not limited to only one person. Also see the "Ad Hoc Committee Chairpersons" on the inside front cover and the "Special Interest Groups Listing" article.

<b>Subject</b>	<b>Name</b>	<b>Phone</b>
Asteroids .....	Barbara Wilson .....	281-933-1289
Astrometry .....	Richard Nugent .....	713-910-5945
Astrophotography .....	Steve Goldberg .....	713-721-5077
Beginning in Astronomy .....	Peggy Gilchrist .....	281-558-1190
	Amelia Goldberg .....	713-721-5077
Comets .....	Kenneth Drake .....	281-367-1592
	Don Pearce .....	713-432-0734
Computers .....	Matt Delevoryas .....	713-795-0808
	Leland Dolan .....	713-529-0403
	Ricardo Palmeira .....	713-669-1409
Cosmology .....	Ricardo Palmeira .....	713-669-1409
Deep Sky .....	Larry Mitchell .....	281-448-8700
	Barbara Wilson .....	281-933-1289
Double Stars .....	John Blubaugh .....	713-921-4275
Drawing (Sketching) .....	Scott Mitchell .....	713-461-3020
Herschel Objects .....	Larry Mitchell .....	281-448-8700
History, Astro'y - General .....	Leland Dolan .....	713-529-0403
	Ricardo Palmeira .....	713-669-1409
History, Astro'y - Amateurs .....	Tom Williams .....	713-526-2868
Mathematics, Astronomical .....	Richard Nugent .....	713-910-5945
Messier Objects .....	Novice Committee (see inside front cover)	
Photometry .....	Tom Arnold .....	281-495-0142
Radio Telescopes .....	John Hiatt .....	713-464-4010
Satellites, Artificial .....	<open>	
Solar Observing .....	Larry Mitchell .....	281-448-8700
Spectroscopy .....	Tom Arnold .....	281-495-0142
Thin Crescent Moons .....	Don Pearce .....	713-432-0734
Variable Stars .....	Barbara Wilson .....	281-933-1289
	Tom Williams .....	713-526-2868
Video .....	Larry Mitchell .....	281-448-8700

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# *HAS Logo Sales*

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by *Judy Ann Dye*

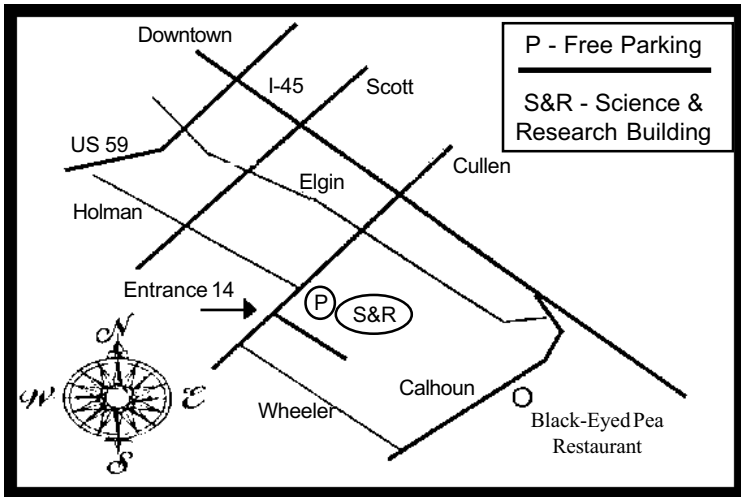
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**The 1999 Observer's Handbook is IN.** You need one. This indispensable guide to the night sky includes:

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Get your copy at the January meeting!!



### General Membership Meeting

The Houston Astronomical Society holds its regular monthly General Membership Meeting on the first Friday of each month, unless rescheduled due to a holiday. Meetings are in Room 117 of the Science and Research Building at the University of Houston. A Novice Presentation begins at 7:00 p.m.. The short business meeting and featured speaker are scheduled at 8:00 p.m. Also typically included are Committee Reports, Special Interest Group Reports, current activity announcements, hardware reviews, an astrophotography slide show by members and other items of interest.

### Board of Directors Meeting

The Board of Directors Meeting is held on dates scheduled by the board at 7:00 p.m. in Room 106 of the Space Science Building at Rice University. Call StarLine for Board Meeting information. Information provided to GuideStar will be published. The meetings are open to all members of the Society in good standing. Attendance is encouraged.

### GuideStar Information

The H.A.S. *GuideStar* is published monthly by the Houston Astronomical Society. All opinions expressed herein are those of the contributor and not necessarily of Houston Astronomical Society. The monthly Meeting Notice is included herein. *GuideStar* is sent via bulk rate mail to Regular, Student, and Honorary Members of H.A.S., selected individuals and recent visitors to the General Membership Meeting. Contributions to *GuideStar* by members are encouraged. Electronic submission is helpful. Submit the article in ASCII text, MS-Word (preferred), or WordPerfect format on an IBM format floppy or via AOL (BILLP10566). Mail copy to the address shown on the outside cover or to the editor at 256 East 5th Street, Houston, TX 77007. Copy must be received by the second Friday of the month for inclusion in the issue to be mailed near the end of the same month. Or, bring copy to the General Membership Meeting and give it to the Editor, or phone to make special arrangements.

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