



# **December, 1998**

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*At the December 4 meeting...*

## **Dr. Anita Cochran**

**University of Texas**

Comets, left over from the origin of our solar system, can tell us a lot about how our solar system became what it is.

This talk covers Cometary research and the Contour mission scheduled for 2002.

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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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	Liaison responsibility
John Blubaugh ..... 713-921-4275	Publicity, telescope
Jay Levy ..... 281-992-2708	Program, Field Trip/Observing
Warren Wundt ..... 713-697-2960	Audit, Program, Field Trip/Observing
Tom Fox ..... 281-358-5419	Education, Welcoming

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

Audit ..... Mike Gumler ..... 409-938-4793	Program ..... John Chauvin ..... 713-981-8281
Education ..... James Benthall ..... 713-669-0838	Publicity ..... Marg Nunez ..... 713-529-2549
Field Tr./Obsg. .... Kenneth Drake ..... 281-367-1592	Telescope ..... Clayton Jeter ..... 281-383-1337
Novice ..... Mitchell/Goldberg ..... 713-461-3020	Welcoming ..... Susan Spore ..... 281-493-2614
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*



I think the big surprise from the recent Leonid meteor shower was the high number of fireballs reported.

While no reports from anywhere in the world approximated the 100,000+ hourly rate of 1966, most observers, even in Asia, observed from about 100-200 per hour. There were isolated incidences of observations of 1000-2000 per hour (Canary Islands and a few other locations), but the big surprise was the high proportion of “fireballs” and bolides reported.

I was with a group that arrived at Columbus just after midnight (Tuesday morning 17<sup>th</sup>) and found ourselves totally enshrouded in fog (after leaving Houston at 10 p.m. with clear skies!). After speaking to Larry Wadle on the phone (he indicated it was “fogged in” at both Weimar and Austin), we felt that a rise in elevation was possibly the key so we headed towards “West Point Park”, an elevated scenic overlook on Hwy. 71 between La Grange and Smithville. The trip west, however, saw the “fog cover” increase, and we switched directions near La Grange and headed back east (out of desperation). About two miles east of Sealy we saw stars. We headed north of the Stephen F. Austin State Park, found a dark location, and observed the Leonids for about an hour before it “fogged over” again. During that time, we observed numerous bright meteors and a few “fireballs”, and for one ten minute span we were observing about 2 meteors per minute. The limiting magnitude was about 4-4.5. (There was still some ground fog, but it was thin.) Oddly enough the brightest fireball we observed was a -6 magnitude sporadic.

I have seen the term fireball and bolide tossed around frequently over the internet and for purposes of definition I think we should all agree on some common terms. I believe these are reliable sources:

*Continued on page 7...*

# *Houston Astronomical Society*

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*Meeting Notice  
For Friday, December 4, 1998*

## *Dr. Anita Cochran* *University of Texas*

Comets are the least altered bodies left over from the origin of the solar system. Thus, study of comets offers constraints for models of the solar system. In this talk, Dr. Cochran will review our current state of understanding of comets, including what we learned from Hale-Bopp and then will discuss all of the past and current missions to comets. She will emphasize the CONTOUR mission because she is a member of the CONTOUR science team designing this mission for launch in 2002.

### **Schedule of meeting activities:**

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

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

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

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

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# December Calendar:

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<i>Date</i>	<i>Time</i>	<i>Event</i>
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## December

3	11:19 p.m.	Full Moon, and closest perigee of 1998
4		HAS Club Meeting
	7:00 p.m.	Novice Presentation - U of H
	8:00 p.m.	General Membership Meeting - U of H
10	11:55 a.m.	Moon at Third Quarter
12		Members Observatory Night-Columbus
13	11:00 p.m.	Geminid Meteor Shower Peaks
15	7:00 p.m.	Advanced SIG Mtg.-Rice Univ., contact Bill Flanagan, 713-699-8819
18	4:43 p.m.	New Moon
19		Prime Night-Columbus
21	7:56 p.m.	Winter Solstice, Winter begins
26	4:46 a.m.	First Quarter Moon

## January, 1999

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 Quarter Moon

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

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## *President's Message... from page 4*

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1. **Fireball**- any meteor that attains a “fiery” head appearance and reaches -4 or -5 (depending on source) magnitude.
2. **Bolide**- a fireball that explodes (from ablation) and releases visible fiery fragments (sometimes accompanied by a sonic boom).

By the way, Dr. Anita Cochran of the University of Texas will be our speaker and comets! will be the topic.

Clear skies and le croissant lunaire

*Don Pearce*

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## *December Comets... from page 22*

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1998 Dec 6 0:00	Dec 6 6:00	06 36 29.1	+48 07 19 12.9	0.8697	1.7778	147
1998 Dec 7 0:00	Dec 7 6:00	06 35 57.7	+48 06 54 13.0	0.8697	1.7809	147
1998 Dec 8 0:00	Dec 8 6:00	06 35 23.8	+48 06 06 13.0	0.8699	1.7841	148
1998 Dec 9 0:00	Dec 9 6:00	06 34 47.7	+48 04 55 13.0	0.8702	1.7874	149
1998 Dec 10 0:00	Dec 10 6:00	06 34 9.5	+48 03 21 13.0	0.8708	1.7907	150
1998 Dec 11 0:00	Dec 11 6:00	06 33 29.3	+48 01 24 13.0	0.8715	1.7940	150
1998 Dec 12 0:00	Dec 12 6:00	06 32 47.3	+47 59 04 13.0	0.8724	1.7974	151
1998 Dec 13 0:00	Dec 13 6:00	06 32 3.6	+47 56 20 13.0	0.8735	1.8008	151
1998 Dec 14 0:00	Dec 14 6:00	06 31 18.4	+47 53 11 13.1	0.8748	1.8043	152
1998 Dec 15 0:00	Dec 15 6:00	06 30 31.8	+47 49 39 13.1	0.8762	1.8078	153
1998 Dec 16 0:00	Dec 16 6:00	06 29 44.1	+47 45 42 13.1	0.8779	1.8114	153
1998 Dec 17 0:00	Dec 17 6:00	06 28 55.3	+47 41 22 13.1	0.8797	1.8150	154
1998 Dec 18 0:00	Dec 18 6:00	06 28 5.7	+47 36 37 13.1	0.8817	1.8187	154

I would very much like to know if anyone has any observations to pass along of these comets in late November or December.

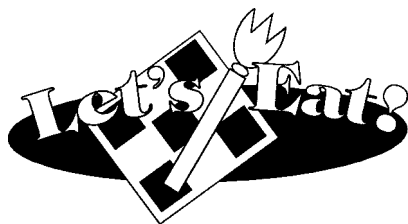
*Kenneth Drake — Comet SIG Chairman*  
*(281) 367 1592*

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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.

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



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## ***List Server added to HAS Web Site***

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*By Steve Goldberg, HAS Webmaster*

A new feature has been added to the HAS web site - a List Server. This is a combination of a news group and email.

When you subscribe to the list server group and send an email to the list server, then all people that have subscribed will get a copy in their email in-box. This is a forum to pass ideas, explain topics in astronomy, discuss upcoming events, "how-to" discussions; anything that can be found in the traditional news groups. The difference is that the messages will come to your mail box, you do not have go to the news group to get the postings.

To subscribe:

1. Send an email to: [listserv@netlan-inc.com](mailto:listserv@netlan-inc.com)
2. In the body of the message, put the words: subscribe haslist  
<your name> (without the <>)
3. To make a posting, send an email to: [haslist@netlan-inc.com](mailto:haslist@netlan-inc.com)

Please subscribe and utilize this neat feature.

*Regards,  
Steve Goldberg  
WebMaster  
Houston Astronomical Society*



<http://spacsun.rice.edu/~has>

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# ***Election Notice***

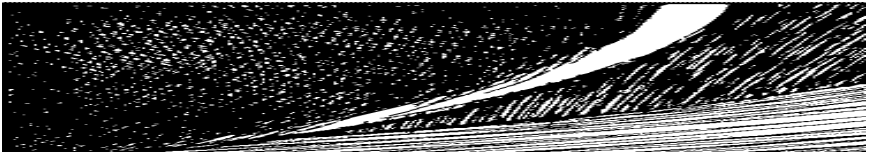
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*by Matt Delevoryas, Secretary*

On November 6th, the Annual Meeting of the Society, an election was held for Chairman of the Education Committee for 1999. Due to a miscommunication, it was not realized until after too many members had left the meeting that a runoff was necessary for that election. As a result, there is a vacancy effective January 1st in the office of Chairman of the Education Committee. This shall serve as notice that the Society shall hold an election for Chairman of the Education Committee at the January 8th (note: not the 1st) meeting. The winner of the election shall serve from January 8th until December 31st.

Any member with no lapse in membership since January 8th, 1998, is eligible to run for Chairman. For any further information, contact any Officer of the Society. (See the inside cover for telephone numbers.) In the unfortunate event that a quorum of the Society does not attend the January meeting, this shall serve as notice for an election at the February 5th meeting.

The Chairman of the Education Committee appoints members to the Committee. The Bylaws describe the duties of the Education Committee as “shall arrange for activities which educate members of the community concerning astronomy.” In practice, this has excluded star parties (those being handled by the Board’s ad hoc Public Star Party Committee), and has usually involved programs presented to schools, scout groups, etc.



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# *A Guided Tour...*

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*by Clayton L. Jeter, Telescope Loaner Chairperson*

In the past month or so, several new society members have asked, "Which star atlas do I need for use with my borrowed telescope?" I try to guide them in the right direction; whether to buy in Houston or mail order. Many of our newer members are in need of these maps when at use at the eyepiece. Which leads me to another useful idea ... how about issuing out the loaner telescope with a star atlas or charts if needed?! I'm sure many of our members have several of these maps that are never used at home or in the field. These much needed tools can be donated to our program and will be extremely useful to our society members when they check out one of our scopes. Simply bring your copy to one of our meetings and I will forward it with each telescope that is checked out. Let's help our new members navigate the night sky ... see you at the meeting.

*cloudless night skies...always, Clayton L. Jeter*

Hm: 281-383-1337; E-mail: stonebloke@aol.com

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## *Leonid Observations*

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*by John Blubaugh*

Don and I drove to Columbus to look for Leonids only to turn back once we got there on account of fog. Don called Larry Wadle (who was in Weimar) on his cell, and learned from Larry that the fog had inundated skies as far west as Austin. We then drove up Hwy 71 heading for West Point Park, but turned back after only a few miles because of 200 foot visibility.

We then headed to a small state park near Sealy, I think, where the fog miraculously broke. We saw perhaps a few dozen Leonids the brightest about mag -6. After about an hour, the fog rolled back in but we still managed to spot quite a few through the fog, some flashes of light being as low as 10 deg above the horizon in otherwise conditions.

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# *Jupiter Moon Observation*

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*By John Blubaugh*

On Wednesday evening October 28, several friends and I played a few quick games of basketball under the street lights of a quiet subdivision in Clear Lake. My telescope was set up in my boss' back yard and we had been sneaking peeks at Jupiter, the moon, and Saturn during breaks in the three games we played.

After the games were over at approximately 9:30 p.m., and while observing Jupiter with a 4 inch Takahashi refractor, we made a quite unusual observation of Callisto, Jupiter's fourth satellite. Actually, it was Callisto's shadow that intrigued us. Callisto's shadow was observed transiting Jupiter's disk, but this turned out to be no ordinary shadow transit. The shadow was cast upon the extreme Southern tip of the planet, at such a low latitude, in fact, that the shadow was visibly elongated north/south. (A shadow transit is simply the shadow of a satellite cast upon a planet. An observer on that planet who is under the shadow would see an eclipse of the sun.)

After researching the matter with the help of HAS president Don Pearce, it was determined that this was the last shadow transit by Callisto observable from the Western hemisphere in 1998. Callisto makes one revolution of Jupiter about every 16.7 days, and about every 50 days, this places it in roughly the same relative position around Jupiter for a given location on the Earth. We also discovered that there will apparently not be any observable shadow transits by Callisto in 1999. The next shadow transit by Callisto observable from Earth won't be until at least January of 2000, perhaps later.

What we saw was Jupiter's equivalent to the end of a Saros cycle of solar eclipses on earth. It's safe to conclude that Callisto's shadow was being cast progressively farther south on Jupiter throughout the later part of 1998 and because of this, the shadow would eventually be cast so far south that it would no longer intersect with Jupiter's disk.

With me that evening were my boss, Vince O'Bar, and his wife Wendy, their two young sons Nicolas and David, and two neighbors: Dr. Joe Hahn (a.k.a. "Air Jordan") of the Lunar and Planetary Institute, and Joe Mendez.

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# ***HAS Logo Sales***

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by *Judy Ann Dye*

The *Observer's Handbook* is in. I know that some of you didn't get a chance to buy one at the November meeting. So you can do this: The price of the book is \$14.00 each. You can send me a check made out to HAS for the amount. My address is 12352 Newbrook, Houston Tx 77072-3910.

I also have access to a very nice desk calendar. It would make nice gifts for the upcoming year. It has space and science pictures in it, and the calendar is laid out in two different ways. The price of it is \$15.00.

I have also been asked for hooded sweatshirts. I am taking names of the ones who would be interested. When I have some idea how many want them, I will be able to give you some idea on how much they will cost. This will be prepaid because of certain instances.

Please give me a call if you are interested in anything or have questions. My phone number is : 281-498-1703.

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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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# *Getting Soaked*

## *....at the Okie-Tex Star Party*

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*Scott Mitchell & Kenneth Drake*

This year the Okie-Tex Star Party was held October 18 - October 25 at the Prude Guest Ranch. This is the same site used by the Texas Star Party in summer. Summer at the Prude Guest Ranch can be a hot and dusty affair, so we looked forward to seeing the Davis Mountains in the fall.



Well, there sure wasn't a dust problem. Hard to have dust when the central observing field lies underneath a couple of inches of near-freezing water. And that's pretty much the story of the Okie-Tex Star Party, sad to say.

Saturday night offered excellent viewing. Kenneth Drake got to west Texas early and managed to observe until hitting the "wall" at around 2:30 Sunday Morning. Many star party participants never saw those clear skies, however, because they were desperately fighting their way through the flooding in Central and South Texas. Highway 10, the main thoroughfare to the hill country and beyond, was closed at several locations, so whole caravans of telescope-bearing vehicles struck out over the back roads, trying to stay ahead of the flooding rivers and washed-out roads. And rather than find blue skies behind this front, we found instead the backlash of the hurricane whirling up the west coast from Mexico.

And so it went, all week long. Thick overhead clouds, hard rains broken only by cold drizzle. About a hundred and fifty people attended, but each evening found the observing fields deserted, the would-be astronomers instead watching the weather channel on television. And each night it was the same story: great swathes of overcast cloud systems being flung across the map of West Texas, with occasional inserts of Texas flooding.

*Continued...*

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## *Getting Soaked... from previous page*

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The talks were good. Robert Burnham traced the development of star catalogs. Richard Berry gave an excellent history of Dobsonian telescopes (including the one whose drive motor consisted of a controlled-deflation of an inner tube underneath the rocker box—the infamous “Hissing Dob”). Dave Eicher gave a presentation on “How Ordinary Stars Die” which focused mainly on Planetary Nebula. Side-trips by day also filled in the week: Carlsbad Caverns, Guadalupe National Park, Chihuahuan Desert Research Institute, and photo excursions to capture the rarely wet Davis Mountains—all these were a nice escape from contemplating endless grey skies. But the truth be told, it was downright discouraging to watch the rains gather in pools on the telescope covers all week long. There’s Kenneth Drake in the field below, his stocky figure giving the tube of his 24-inch telescope a mighty heave so that the gathered water cascades over the rocker box to splash on the ground. And there’s Scott Mitchell, watching the carpet and tarp he used to “stake his ground” for observing on the field sink deeper into the mud with every successive rainstorm.

Friday night. After a day of patches of blue skies, the remaining observers opened up their scopes, the scattered sunlight warming the field and drying the ground. But by the time the evening rolled around, the skies grew thick with the all-too-familiar low cloud cover, hugging the hills around the ranch. Then—miracle of miracles—the skies opened up again! Covers came off scopes, the talk grew more animated... then the dark-bellied clouds swept in once more. And so on, all night long. Kenneth did get some observing done which included several comets and nearby planetaries, until the dew came, sappy air soaking everything. Drake packed up and left on Saturday afternoon only to find clear skies at Columbus just before dawn. He didn’t stop!

Despite the lack of stars, the Okie-Tex Star Party was still a lot of fun. A little more scruffy than the TSP, and without the organization and breadth of TSP—but still fun. Next year’s Okie-Tex will be held in Oklahoma, on October 4. And the Prude Ranch will independently open up their ranch for a star party on January 10 - 16. If you’re interested, the number for the Prude Ranch is 1-800-458-6232; fax 915-426-3502. There shouldn’t be any more rain. We must have used it up for years to come, at this year’s Okie-Tex.

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# Observatory Duty Roster

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by Michael B. Dye, Observatory Chairman

This is the duty list for November, December 1998 and January 1999. 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 December supervisor ..... Kirk Kendrick ..... 281 391-3834**

John Mitscherling ..... Members Observatory Night 12-12-98  
Jeff Moore ..... Site  
Debbie Moran ..... Site  
Ben Negy Jr. .... Members Observatory Night 12-12-98  
Johnny Norris ..... Site  
Richard Nugent ..... Members Observatory Night 12-12-98  
Ralph Overturf Jr. .... Site  
Don C. Pearce ..... Site

**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 ..... Site Members Observatory Night 02-13-99  
Buster Wilson ..... Site Members Observatory Night 02-13-99  
Warren Wundt ..... 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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# December's Comets

By Kenneth Drake — Comet SIG Chairman

The following comet positions are provided by the Comet SIG using MegaStar ver. 4 and elements from: <http://cfa-www.harvard.edu/cfa/ps/Ephemerides/Comets/SoftwareComets.html>

E=elongation, S.D.=sun distance, E.D.=Earth distance, RA and Dec are epoch 2000.

Comet Harrington-Abell is currently mag. 12.5 (late October-when I'm writing this). This is about 5 mags above predictions for this comet. It is a well placed morning object approaching a loop through Auriga in a galaxy rich area.

## Harrington-Abell 52P

Local Time	U.T.	RA	Dec	Mag	E.D.	S.D.	E
1998 Nov 19 0:00	Nov 19 6:00	07 14 16.9	+39 49 17 17.8	1.0842	1.8756	130	
1998 Nov 21 0:00	Nov 21 6:00	07 16 8.0	+39 57 17 17.7	1.0654	1.8692	131	
1998 Nov 23 0:00	Nov 23 6:00	07 17 50.1	+40 05 07 17.7	1.0470	1.8629	133	
1998 Nov 25 0:00	Nov 25 6:00	07 19 23.0	+40 12 43 17.6	1.0292	1.8568	134	
1998 Nov 27 0:00	Nov 27 6:00	07 20 46.6	+40 20 05 17.5	1.0120	1.8508	136	
1998 Nov 29 0:00	Nov 29 6:00	07 22 0.6	+40 27 08 17.5	0.9953	1.8450	137	
1998 Dec 1 0:00	Dec 1 6:00	07 23 4.8	+40 33 52 17.4	0.9792	1.8394	139	
1998 Dec 3 0:00	Dec 3 6:00	07 23 59.0	+40 40 12 17.4	0.9637	1.8339	140	
1998 Dec 5 0:00	Dec 5 6:00	07 24 43.1	+40 46 07 17.3	0.9489	1.8286	142	
1998 Dec 7 0:00	Dec 7 6:00	07 25 16.9	+40 51 32 17.3	0.9346	1.8234	144	
1998 Dec 9 0:00	Dec 9 6:00	07 25 40.4	+40 56 24 17.2	0.9210	1.8184	145	
1998 Dec 11 0:00	Dec 11 6:00	07 25 53.4	+41 00 39 17.2	0.9081	1.8137	147	
1998 Dec 13 0:00	Dec 13 6:00	07 25 56.2	+41 04 11 17.1	0.8958	1.8090	148	
1998 Dec 15 0:00	Dec 15 6:00	07 25 48.8	+41 06 57 17.1	0.8843	1.8046	150	
1998 Dec 17 0:00	Dec 17 6:00	07 25 31.6	+41 08 51 17.0	0.8734	1.8003	151	
1998 Dec 19 0:00	Dec 19 6:00	07 25 4.9	+41 09 48 17.0	0.8633	1.7963	153	
1998 Dec 21 0:00	Dec 21 6:00	07 24 29.3	+41 09 44 17.0	0.8539	1.7924	154	
1998 Dec 23 0:00	Dec 23 6:00	07 23 45.4	+41 08 33 16.9	0.8452	1.7887	156	
1998 Dec 25 0:00	Dec 25 6:00	07 22 53.9	+41 06 11 16.9	0.8374	1.7852	157	
1998 Dec 27 0:00	Dec 27 6:00	07 21 55.5	+41 02 35 16.9	0.8303	1.7819	158	
1998 Dec 29 0:00	Dec 29 6:00	07 20 51.3	+40 57 40 16.8	0.8240	1.7788	160	
1998 Dec 31 0:00	Dec 31 6:00	07 19 42.1	+40 51 25 16.8	0.8184	1.7758	160	
1999 Jan 2 0:00	Jan 2 6:00	07 18 28.8	+40 43 46 16.8	0.8137	1.7731	161	
1999 Jan 4 0:00	Jan 4 6:00	07 17 12.4	+40 34 42 16.8	0.8098	1.7706	162	
1999 Jan 6 0:00	Jan 6 6:00	07 15 53.9	+40 24 12 16.7	0.8067	1.7683	162	
1999 Jan 8 0:00	Jan 8 6:00	07 14 34.5	+40 12 15 16.7	0.8044	1.7661	162	
1999 Jan 10 0:00	Jan 10 6:00	07 13 15.1	+39 58 51 16.7	0.8029	1.7642	162	
1999 Jan 12 0:00	Jan 12 6:00	07 11 57.0	+39 44 02 16.7	0.8022	1.7625	161	

*Continued...*

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## *December Comets... from previous page*

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1999 Jan 14 0:00	Jan 14 6:00	07 10 41.2	+39 27 49 16.7	0.8024	1.7610	161
1999 Jan 16 0:00	Jan 16 6:00	07 09 29.0	+39 10 15 16.7	0.8033	1.7597	160
1999 Jan 18 0:00	Jan 18 6:00	07 08 21.2	+38 51 23 16.7	0.8051	1.7586	159
1999 Jan 20 0:00	Jan 20 6:00	07 07 19.0	+38 31 18 16.7	0.8077	1.7577	158
1999 Jan 22 0:00	Jan 22 6:00	07 06 23.2	+38 10 04 16.7	0.8111	1.7570	156
1999 Jan 24 0:00	Jan 24 6:00	07 05 34.7	+37 47 46 16.7	0.8152	1.7565	155
1999 Jan 26 0:00	Jan 26 6:00	07 04 54.2	+37 24 31 16.7	0.8202	1.7562	153
1999 Jan 28 0:00	Jan 28 6:00	07 04 22.1	+37 00 23 16.8	0.8259	1.7562	152
1999 Jan 30 0:00	Jan 30 6:00	07 03 58.9	+36 35 30 16.8	0.8323	1.7563	150
1999 Feb 1 0:00	Feb 1 6:00	07 03 45.0	+36 09 55 16.8	0.8395	1.7567	148
1999 Feb 3 0:00	Feb 3 6:00	07 03 40.5	+35 43 46 16.8	0.8474	1.7572	147
1999 Feb 5 0:00	Feb 5 6:00	07 03 45.7	+35 17 07 16.8	0.8560	1.7580	145
1999 Feb 7 0:00	Feb 7 6:00	07 04 0.6	+34 50 02 16.9	0.8652	1.7590	144
1999 Feb 9 0:00	Feb 9 6:00	07 04 25.3	+34 22 38 16.9	0.8752	1.7602	142
1999 Feb 11 0:00	Feb 11 6:00	07 04 59.8	+33 54 58 16.9	0.8858	1.7616	140
1999 Feb 13 0:00	Feb 13 6:00	07 05 44.1	+33 27 05 17.0	0.8971	1.7632	139
1999 Feb 15 0:00	Feb 15 6:00	07 06 38.1	+32 59 05 17.0	0.9090	1.7650	137
1999 Feb 17 0:00	Feb 17 6:00	07 07 41.7	+32 31 00 17.0	0.9215	1.7670	135
1999 Feb 19 0:00	Feb 19 6:00	07 08 54.6	+32 02 54 17.1	0.9346	1.7692	134
1999 Feb 21 0:00	Feb 21 6:00	07 10 16.7	+31 34 48 17.1	0.9483	1.7716	132
1999 Feb 23 0:00	Feb 23 6:00	07 11 47.6	+31 06 46 17.2	0.9625	1.7742	131
1999 Feb 25 0:00	Feb 25 6:00	07 13 27.0	+30 38 50 17.2	0.9773	1.7770	129

Comet Linear M5 has just finished a loop in Lyra and will be an early evening object, setting near 22:00 CST.

### ***LINEAR C/1998 M5***

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1998 Nov 19 0:00	Nov 19 6:00	18 45 48.7	+36 01 00 10.4	2.0210	1.9405	71
1998 Nov 20 0:00	Nov 20 6:00	18 45 40.4	+36 01 16 10.4	2.0234	1.9350	71
1998 Nov 21 0:00	Nov 21 6:00	18 45 33.7	+36 01 49 10.4	2.0256	1.9295	70
1998 Nov 22 0:00	Nov 22 6:00	18 45 28.5	+36 02 40 10.4	2.0277	1.9241	70
1998 Nov 23 0:00	Nov 23 6:00	18 45 24.6	+36 03 49 10.4	2.0296	1.9188	69
1998 Nov 24 0:00	Nov 24 6:00	18 45 22.2	+36 05 17 10.4	2.0312	1.9135	69
1998 Nov 25 0:00	Nov 25 6:00	18 45 21.2	+36 07 03 10.3	2.0328	1.9083	69
1998 Nov 26 0:00	Nov 26 6:00	18 45 21.5	+36 09 07 10.3	2.0341	1.9031	68
1998 Nov 27 0:00	Nov 27 6:00	18 45 23.0	+36 11 31 10.3	2.0352	1.8981	68
1998 Nov 28 0:00	Nov 28 6:00	18 45 25.9	+36 14 13 10.3	2.0362	1.8930	68
1998 Nov 29 0:00	Nov 29 6:00	18 45 30.0	+36 17 15 10.3	2.0370	1.8881	67
1998 Nov 30 0:00	Nov 30 6:00	18 45 35.2	+36 20 36 10.3	2.0375	1.8832	67
1998 Dec 1 0:00	Dec 1 6:00	18 45 41.6	+36 24 16 10.3	2.0379	1.8784	67
1998 Dec 2 0:00	Dec 2 6:00	18 45 49.2	+36 28 16 10.3	2.0381	1.8737	66
1998 Dec 3 0:00	Dec 3 6:00	18 45 57.8	+36 32 36 10.3	2.0381	1.8690	66
1998 Dec 4 0:00	Dec 4 6:00	18 46 7.6	+36 37 16 10.3	2.0380	1.8645	66
1998 Dec 5 0:00	Dec 5 6:00	18 46 18.4	+36 42 17 10.2	2.0376	1.8599	66
1998 Dec 6 0:00	Dec 6 6:00	18 46 30.3	+36 47 38 10.2	2.0370	1.8555	65
1998 Dec 7 0:00	Dec 7 6:00	18 46 43.1	+36 53 19 10.2	2.0362	1.8511	65
1998 Dec 8 0:00	Dec 8 6:00	18 46 57.0	+36 59 22 10.2	2.0353	1.8469	65

*Continued...*

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## *December Comets... from previous page*

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1998 Dec 9 0:00	Dec 9 6:00	18 47 11.9	+37 05 46 10.2	2.0341	1.8427	65
1998 Dec 10 0:00	Dec 10 6:00	18 47 27.7	+37 12 31 10.2	2.0328	1.8385	65
1998 Dec 11 0:00	Dec 11 6:00	18 47 44.4	+37 19 38 10.2	2.0312	1.8345	64
1998 Dec 12 0:00	Dec 12 6:00	18 48 2.1	+37 27 07 10.2	2.0295	1.8305	64
1998 Dec 13 0:00	Dec 13 6:00	18 48 20.7	+37 34 59 10.2	2.0275	1.8266	64
1998 Dec 14 0:00	Dec 14 6:00	18 48 40.1	+37 43 13 10.1	2.0254	1.8228	64
1998 Dec 15 0:00	Dec 15 6:00	18 49 0.4	+37 51 49 10.1	2.0230	1.8190	64
1998 Dec 16 0:00	Dec 16 6:00	18 49 21.5	+38 00 50 10.1	2.0205	1.8154	64
1998 Dec 17 0:00	Dec 17 6:00	18 49 43.4	+38 10 13 10.1	2.0177	1.8118	64
1998 Dec 18 0:00	Dec 18 6:00	18 50 6.1	+38 20 00 10.1	2.0148	1.8083	64

Comet Meunier-Dupouy is moving southeast in Capricornus and on Dec. 18 approaches a point of intersection with now fading Comet Howell near 21h 26m -18d 10m. Comet Giacobini-Zinner just swept past that point on Dec. 1. Busy place!!

### *Meunier-Dupouy C/1997 J2*

1998 Nov 19 0:00	Nov 19 6:00	21 06 20.0	-15 03 44 12.4	3.9944	3.9077	78
1998 Nov 20 0:00	Nov 20 6:00	21 06 49.5	-15 11 41 12.4	4.0170	3.9134	77
1998 Nov 21 0:00	Nov 21 6:00	21 07 19.7	-15 19 28 12.5	4.0395	3.9192	76
1998 Nov 22 0:00	Nov 22 6:00	21 07 50.5	-15 27 05 12.5	4.0620	3.9250	75
1998 Nov 23 0:00	Nov 23 6:00	21 08 22.1	-15 34 33 12.5	4.0844	3.9308	74
1998 Nov 24 0:00	Nov 24 6:00	21 08 54.3	-15 41 51 12.5	4.1068	3.9366	73
1998 Nov 25 0:00	Nov 25 6:00	21 09 27.1	-15 49 00 12.5	4.1291	3.9424	72
1998 Nov 26 0:00	Nov 26 6:00	21 10 0.6	-15 56 00 12.6	4.1513	3.9483	71
1998 Nov 27 0:00	Nov 27 6:00	21 10 34.6	-16 02 51 12.6	4.1735	3.9541	70
1998 Nov 28 0:00	Nov 28 6:00	21 11 9.3	-16 09 33 12.6	4.1955	3.9600	70
1998 Nov 29 0:00	Nov 29 6:00	21 11 44.5	-16 16 07 12.6	4.2175	3.9658	69
1998 Nov 30 0:00	Nov 30 6:00	21 12 20.3	-16 22 32 12.6	4.2394	3.9717	68
1998 Dec 1 0:00	Dec 1 6:00	21 12 56.7	-16 28 49 12.6	4.2612	3.9776	67
1998 Dec 2 0:00	Dec 2 6:00	21 13 33.6	-16 34 58 12.7	4.2829	3.9835	66
1998 Dec 3 0:00	Dec 3 6:00	21 14 11.1	-16 40 58 12.7	4.3045	3.9894	65
1998 Dec 4 0:00	Dec 4 6:00	21 14 49.0	-16 46 51 12.7	4.3260	3.9953	64
1998 Dec 5 0:00	Dec 5 6:00	21 15 27.5	-16 52 37 12.7	4.3474	4.0012	63
1998 Dec 6 0:00	Dec 6 6:00	21 16 6.5	-16 58 15 12.7	4.3686	4.0072	62
1998 Dec 7 0:00	Dec 7 6:00	21 16 46.0	-17 03 45 12.7	4.3898	4.0131	61
1998 Dec 8 0:00	Dec 8 6:00	21 17 25.9	-17 09 09 12.8	4.4109	4.0191	61
1998 Dec 9 0:00	Dec 9 6:00	21 18 6.3	-17 14 25 12.8	4.4318	4.0250	60
1998 Dec 10 0:00	Dec 10 6:00	21 18 47.2	-17 19 34 12.8	4.4526	4.0310	59
1998 Dec 11 0:00	Dec 11 6:00	21 19 28.6	-17 24 37 12.8	4.4733	4.0370	58
1998 Dec 12 0:00	Dec 12 6:00	21 20 10.4	-17 29 32 12.8	4.4938	4.0430	57
1998 Dec 13 0:00	Dec 13 6:00	21 20 52.6	-17 34 22 12.8	4.5142	4.0490	56
1998 Dec 14 0:00	Dec 14 6:00	21 21 35.2	-17 39 05 12.9	4.5345	4.0550	55
1998 Dec 15 0:00	Dec 15 6:00	21 22 18.3	-17 43 41 12.9	4.5546	4.0610	54
1998 Dec 16 0:00	Dec 16 6:00	21 23 1.8	-17 48 12 12.9	4.5746	4.0670	54
1998 Dec 17 0:00	Dec 17 6:00	21 23 45.6	-17 52 36 12.9	4.5944	4.0731	53
1998 Dec 18 0:00	Dec 18 6:00	21 24 29.9	-17 56 55 12.9	4.6141	4.0791	52

*Continued...*

## December Comets... from previous page

Giacobini-Zinner is moving over one degree per day as it zips past NGC 7184, an 11th mag galaxy, on Dec. 8th. From our perspective, a near miss at only five minutes distance. The field that night is swarming with faint galaxies. A fine photo op comes the night of Dec. 14 when this comet passes only 1.4 degrees south of the Helix Nebula (NGC 7293). The Moon is out of the way until 3:00 A.M. with the comet setting around 22:30.

### **Giacobini-Zinner 21P**

1998 Nov 19 0:00	Nov 19 6:00	20 20 27.7	-13 00 02	8.9	0.8563	1.0341	68
1998 Nov 20 0:00	Nov 20 6:00	20 25 30.5	-13 29 35	8.9	0.8548	1.0338	68
1998 Nov 21 0:00	Nov 21 6:00	20 30 36.1	-13 58 48	8.9	0.8534	1.0337	68
1998 Nov 22 0:00	Nov 22 6:00	20 35 44.5	-14 27 40	8.9	0.8523	1.0338	68
1998 Nov 23 0:00	Nov 23 6:00	20 40 55.6	-14 56 08	8.9	0.8513	1.0341	68
1998 Nov 24 0:00	Nov 24 6:00	20 46 9.2	-15 24 10	8.9	0.8506	1.0345	68
1998 Nov 25 0:00	Nov 25 6:00	20 51 25.2	-15 51 45	8.9	0.8502	1.0352	68
1998 Nov 26 0:00	Nov 26 6:00	20 56 43.6	-16 18 49	8.9	0.8499	1.0361	68
1998 Nov 27 0:00	Nov 27 6:00	21 02 4.1	-16 45 21	8.9	0.8499	1.0371	68
1998 Nov 28 0:00	Nov 28 6:00	21 07 26.6	-17 11 19	8.9	0.8501	1.0384	68
1998 Nov 29 0:00	Nov 29 6:00	21 12 51.0	-17 36 41	8.9	0.8506	1.0398	68
1998 Nov 30 0:00	Nov 30 6:00	21 18 17.2	-18 01 25	8.9	0.8513	1.0415	69
1998 Dec 1 0:00	Dec 1 6:00	21 23 44.8	-18 25 29	8.9	0.8522	1.0433	69
1998 Dec 2 0:00	Dec 2 6:00	21 29 13.9	-18 48 51	8.9	0.8534	1.0453	69
1998 Dec 3 0:00	Dec 3 6:00	21 34 44.1	-19 11 29	9.0	0.8548	1.0475	69
1998 Dec 4 0:00	Dec 4 6:00	21 40 15.5	-19 33 23	9.0	0.8565	1.0499	69
1998 Dec 5 0:00	Dec 5 6:00	21 45 47.7	-19 54 29	9.0	0.8584	1.0524	69
1998 Dec 6 0:00	Dec 6 6:00	21 51 20.6	-20 14 48	9.0	0.8605	1.0552	69
1998 Dec 7 0:00	Dec 7 6:00	21 56 54.0	-20 34 18	9.0	0.8629	1.0581	69
1998 Dec 8 0:00	Dec 8 6:00	22 02 27.8	-20 52 57	9.1	0.8655	1.0612	70
1998 Dec 9 0:00	Dec 9 6:00	22 08 1.7	-21 10 44	9.1	0.8683	1.0645	70
1998 Dec 10 0:00	Dec 10 6:00	22 13 35.7	-21 27 40	9.1	0.8714	1.0679	70
1998 Dec 11 0:00	Dec 11 6:00	22 19 9.4	-21 43 42	9.2	0.8747	1.0715	70
1998 Dec 12 0:00	Dec 12 6:00	22 24 42.8	-21 58 50	9.2	0.8782	1.0753	70
1998 Dec 13 0:00	Dec 13 6:00	22 30 15.7	-22 13 04	9.2	0.8820	1.0792	70
1998 Dec 14 0:00	Dec 14 6:00	22 35 47.8	-22 26 24	9.3	0.8860	1.0833	71
1998 Dec 15 0:00	Dec 15 6:00	22 41 19.1	-22 38 48	9.3	0.8902	1.0876	71
1998 Dec 16 0:00	Dec 16 6:00	22 46 49.4	-22 50 18	9.3	0.8946	1.0920	71
1998 Dec 17 0:00	Dec 17 6:00	22 52 18.4	-23 00 54	9.4	0.8992	1.0966	71
1998 Dec 18 0:00	Dec 18 6:00	22 57 46.1	-23 10 34	9.4	0.9041	1.1013	71

Howell is really faint now but is passing near other comets in Capricornus.

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## *December Comets... from previous page*

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### *Howell 88P*

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1998 Nov 19 0:00	Nov 19 6:00	19 53 33.6	-24 43 08 14.9	1.7656	1.5156	59
1998 Nov 20 0:00	Nov 20 6:00	19 57 4.9	-24 33 05 15.0	1.7743	1.5195	59
1998 Nov 21 0:00	Nov 21 6:00	20 00 35.2	-24 22 47 15.0	1.7831	1.5235	59
1998 Nov 22 0:00	Nov 22 6:00	20 04 4.4	-24 12 13 15.0	1.7919	1.5275	58
1998 Nov 23 0:00	Nov 23 6:00	20 07 32.5	-24 01 24 15.1	1.8009	1.5316	58
1998 Nov 24 0:00	Nov 24 6:00	20 10 59.5	-23 50 21 15.1	1.8099	1.5357	58
1998 Nov 25 0:00	Nov 25 6:00	20 14 25.5	-23 39 03 15.1	1.8191	1.5399	58
1998 Nov 26 0:00	Nov 26 6:00	20 17 50.2	-23 27 31 15.1	1.8283	1.5441	58
1998 Nov 27 0:00	Nov 27 6:00	20 21 13.8	-23 15 46 15.2	1.8376	1.5484	57
1998 Nov 28 0:00	Nov 28 6:00	20 24 36.3	-23 03 48 15.2	1.8470	1.5528	57
1998 Nov 29 0:00	Nov 29 6:00	20 27 57.5	-22 51 38 15.2	1.8565	1.5572	57
1998 Nov 30 0:00	Nov 30 6:00	20 31 17.6	-22 39 15 15.3	1.8661	1.5616	57
1998 Dec 1 0:00	Dec 1 6:00	20 34 36.5	-22 26 39 15.3	1.8758	1.5661	57
1998 Dec 2 0:00	Dec 2 6:00	20 37 54.2	-22 13 53 15.3	1.8856	1.5706	56
1998 Dec 3 0:00	Dec 3 6:00	20 41 10.7	-22 00 55 15.3	1.8954	1.5752	56
1998 Dec 4 0:00	Dec 4 6:00	20 44 26.0	-21 47 46 15.4	1.9054	1.5798	56
1998 Dec 5 0:00	Dec 5 6:00	20 47 40.1	-21 34 27 15.4	1.9154	1.5845	56
1998 Dec 6 0:00	Dec 6 6:00	20 50 53.0	-21 20 58 15.4	1.9255	1.5892	55
1998 Dec 7 0:00	Dec 7 6:00	20 54 4.7	-21 07 19 15.5	1.9357	1.5940	55
1998 Dec 8 0:00	Dec 8 6:00	20 57 15.2	-20 53 31 15.5	1.9460	1.5988	55
1998 Dec 9 0:00	Dec 9 6:00	21 00 24.5	-20 39 33 15.5	1.9564	1.6036	55
1998 Dec 10 0:00	Dec 10 6:00	21 03 32.5	-20 25 27 15.6	1.9668	1.6085	54
1998 Dec 11 0:00	Dec 11 6:00	21 06 39.5	-20 11 12 15.6	1.9774	1.6134	54
1998 Dec 12 0:00	Dec 12 6:00	21 09 45.2	-19 56 49 15.6	1.9880	1.6184	54
1998 Dec 13 0:00	Dec 13 6:00	21 12 49.8	-19 42 19 15.7	1.9987	1.6234	54
1998 Dec 14 0:00	Dec 14 6:00	21 15 53.2	-19 27 41 15.7	2.0094	1.6285	53
1998 Dec 15 0:00	Dec 15 6:00	21 18 55.4	-19 12 56 15.7	2.0203	1.6335	53
1998 Dec 16 0:00	Dec 16 6:00	21 21 56.4	-18 58 05 15.8	2.0312	1.6387	53
1998 Dec 17 0:00	Dec 17 6:00	21 24 56.3	-18 43 06 15.8	2.0421	1.6438	53
1998 Dec 18 0:00	Dec 18 6:00	21 27 55.1	-18 28 02 15.8	2.0532	1.6490	52

Comet Williams rises just before dawn and is moving north through Virgo and passes galaxy rich fields near the time of full Moon. Boo hiss!

### *Williams C/1998 P1*

1998 Nov 19 0:00	Nov 19 6:00	13 23 37.8	-20 10 39 10.0	1.9896	1.2576	31
1998 Nov 20 0:00	Nov 20 6:00	13 23 21.1	-19 56 44 10.0	1.9803	1.2641	33
1998 Nov 21 0:00	Nov 21 6:00	13 23 3.7	-19 42 41 10.0	1.9706	1.2708	34
1998 Nov 22 0:00	Nov 22 6:00	13 22 45.4	-19 28 27 10.0	1.9605	1.2776	35
1998 Nov 23 0:00	Nov 23 6:00	13 22 26.3	-19 14 04 10.0	1.9501	1.2846	36
1998 Nov 24 0:00	Nov 24 6:00	13 22 6.3	-18 59 29 10.0	1.9392	1.2917	37
1998 Nov 25 0:00	Nov 25 6:00	13 21 45.4	-18 44 42 10.1	1.9281	1.2989	38

*Continued...*

## *December Comets... from previous page*

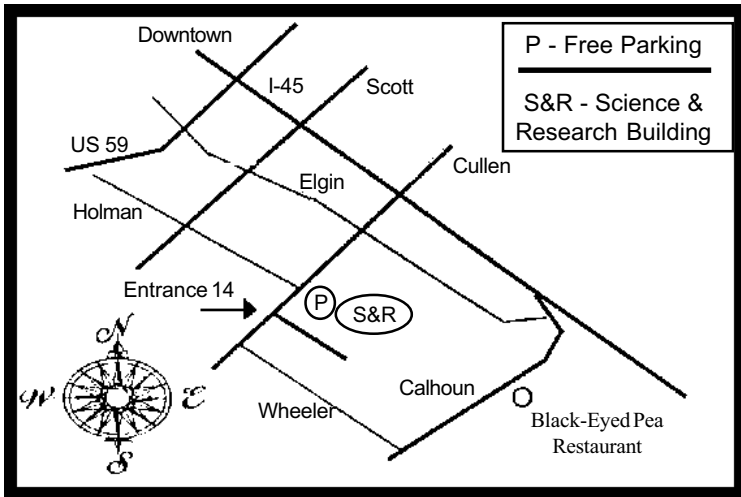
1998 Nov 26 0:00	Nov 26 6:00	13 21 23.6	-18 29 43 10.1	1.9165	1.3063	39
1998 Nov 27 0:00	Nov 27 6:00	13 21 0.7	-18 14 30 10.1	1.9046	1.3138	40
1998 Nov 28 0:00	Nov 28 6:00	13 20 36.7	-17 59 03 10.1	1.8924	1.3214	41
1998 Nov 29 0:00	Nov 29 6:00	13 20 11.6	-17 43 21 10.1	1.8798	1.3292	42
1998 Nov 30 0:00	Nov 30 6:00	13 19 45.3	-17 27 22 10.1	1.8669	1.3370	44
1998 Dec 1 0:00	Dec 1 6:00	13 19 17.8	-17 11 07 10.1	1.8538	1.3450	45
1998 Dec 2 0:00	Dec 2 6:00	13 18 48.9	-16 54 34 10.1	1.8402	1.3531	46
1998 Dec 3 0:00	Dec 3 6:00	13 18 18.8	-16 37 42 10.1	1.8264	1.3614	47
1998 Dec 4 0:00	Dec 4 6:00	13 17 47.2	-16 20 30 10.2	1.8124	1.3697	48
1998 Dec 5 0:00	Dec 5 6:00	13 17 14.1	-16 02 57 10.2	1.7980	1.3781	49
1998 Dec 6 0:00	Dec 6 6:00	13 16 39.4	-15 45 01 10.2	1.7834	1.3867	51
1998 Dec 7 0:00	Dec 7 6:00	13 16 3.1	-15 26 43 10.2	1.7685	1.3953	52
1998 Dec 8 0:00	Dec 8 6:00	13 15 25.1	-15 08 00 10.2	1.7533	1.4041	53
1998 Dec 9 0:00	Dec 9 6:00	13 14 45.4	-14 48 52 10.2	1.7379	1.4129	54
1998 Dec 10 0:00	Dec 10 6:00	13 14 3.7	-14 29 16 10.2	1.7223	1.4218	56
1998 Dec 11 0:00	Dec 11 6:00	13 13 20.1	-14 09 13 10.2	1.7064	1.4309	57
1998 Dec 12 0:00	Dec 12 6:00	13 12 34.5	-13 48 39 10.2	1.6904	1.4400	58
1998 Dec 13 0:00	Dec 13 6:00	13 11 46.6	-13 27 34 10.2	1.6741	1.4492	60
1998 Dec 14 0:00	Dec 14 6:00	13 10 56.6	-13 05 56 10.2	1.6577	1.4584	61
1998 Dec 15 0:00	Dec 15 6:00	13 10 4.1	-12 43 43 10.2	1.6411	1.4678	62
1998 Dec 16 0:00	Dec 16 6:00	13 09 9.2	-12 20 55 10.2	1.6243	1.4772	64
1998 Dec 17 0:00	Dec 17 6:00	13 08 11.8	-11 57 28 10.3	1.6074	1.4867	65
1998 Dec 18 0:00	Dec 18 6:00	13 07 11.6	-11 33 22 10.3	1.5904	1.4963	66

Comet Lovas 1 has just passed perihelion (Oct. 14) and was visible in the morning sky from the (S)Okie-Tex Star Party on the 23rd as a 30 arc second mag 14.8 round glow in the 24 incher at 265 power. It was very wet and dewey at this years Okie-Tex. See the related story.

### **Lovas 1 93P**

1998 Nov 19 0:00	Nov 19 6:00	06 37 53.4	+47 24 44 12.8	0.8926	1.7324	134
1998 Nov 20 0:00	Nov 20 6:00	06 38 15.1	+47 29 29 12.8	0.8901	1.7346	135
1998 Nov 21 0:00	Nov 21 6:00	06 38 33.2	+47 34 00 12.8	0.8878	1.7369	136
1998 Nov 22 0:00	Nov 22 6:00	06 38 47.9	+47 38 16 12.8	0.8856	1.7392	136
1998 Nov 23 0:00	Nov 23 6:00	06 38 59.0	+47 42 17 12.8	0.8835	1.7416	137
1998 Nov 24 0:00	Nov 24 6:00	06 39 6.6	+47 46 01 12.8	0.8816	1.7441	138
1998 Nov 25 0:00	Nov 25 6:00	06 39 10.9	+47 49 30 12.9	0.8798	1.7466	139
1998 Nov 26 0:00	Nov 26 6:00	06 39 11.7	+47 52 41 12.9	0.8781	1.7492	139
1998 Nov 27 0:00	Nov 27 6:00	06 39 9.2	+47 55 35 12.9	0.8766	1.7518	140
1998 Nov 28 0:00	Nov 28 6:00	06 39 3.5	+47 58 11 12.9	0.8752	1.7545	141
1998 Nov 29 0:00	Nov 29 6:00	06 38 54.5	+48 00 29 12.9	0.8740	1.7572	142
1998 Nov 30 0:00	Nov 30 6:00	06 38 42.5	+48 02 28 12.9	0.8729	1.7600	142
1998 Dec 1 0:00	Dec 1 6:00	06 38 27.4	+48 04 07 12.9	0.8720	1.7628	143
1998 Dec 2 0:00	Dec 2 6:00	06 38 9.3	+48 05 27 12.9	0.8712	1.7657	144
1998 Dec 3 0:00	Dec 3 6:00	06 37 48.3	+48 06 26 12.9	0.8706	1.7687	145
1998 Dec 4 0:00	Dec 4 6:00	06 37 24.6	+48 07 05 12.9	0.8701	1.7717	145
1998 Dec 5 0:00	Dec 5 6:00	06 36 58.2	+48 07 23 12.9	0.8698	1.7747	146

*Continued on page 7*



### 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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