



**May, 1999**

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*At the May 7 meeting...*

**Allan H. Treiman**

**"New Images of Mars from the  
Mars Global Surveyor"**

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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	
Secretary: Matt Delevoryas H: 713-795-0808	Past-President: Allen Gilchrist H: 281-558-1190

## ★★★★★★★★★ Additional Board Members ★★★★★★★★★★

Jay Levy ..... 281-992-2708	Liaison responsibility
Bill Leach ..... 713-863-8335	Field Trip and Observing, Program
Bill Molinare ..... 713-664-3261	Observatory, Welcoming
Bill Pellerin ..... 713-880-8061	Education, Telescope
Barbara Wilson ..... 281-933-1289	Audit, Publicity (shared)
Mike Dye ..... 281-498-1703	Novice, Publicity (shared)
	Observatory Director

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

Audit ..... Orv Wiens ..... 281-391-2995	Program ..... Scott Mitchell ..... 713-461-3020
Education ..... Bill Leach ..... 713-863-8335	Publicity ..... Michael Cubstead ..... 713-307-0270
Field Tr./Obsg. .... Kenneth Drake ..... 281-367-1592	Telescope ..... Clayton Jeter ..... 281-383-1337
Novice ..... Sancho/Spore ..... 281-379-4726	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't'y ..... 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!**

Amanda Anderson, Todd J. Brady, David A. Mammone, Michael Martin,  
William Dave Martin

## **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



This past weekend (April 16-19) there were several star parties in Central Texas, and I visited parts of two of them, but I want to focus on one event.

I caravanned from Houston with a friend and fellow astronomer, Chris Mendell, and our primary goal was to head towards Ft. McKavett, where the JSCAS were gathering at the historic site for their star party. However, our first goal was to attempt to observe the very thin crescent Moon (about 21 hours old) that evening.

I am aware that not every amateur astronomer gets “excited” about observing thin crescents, and, really, there is no reason why everyone should. However, I want to explain the reasons that I do. Since 1988 I have some 80 documented attempts at thin crescents (generally, I define a thin crescent as any crescent within  $20^\circ$ , at most, from the Sun and only if it is the last or first doable crescent in the lunar cycle). Forty -five times I have been successful, but I continue doing it because nothing I have experienced in astronomy brings the rush of adrenaline or excitement as the anticipation of observing a thin crescent, and then the sense of awe at the ephemeral beauty of the ever so slender crescent as one first observes it in binoculars in the deep twilight sky. Notice I said binoculars because a telescope is too cumbersome to have to drag along and set up at these sometimes remote and awkward sites, and (2) if one had to rely on naked eye sightings alone you would miss the beauty of the crisp binocular view you can only achieve using optics, in addition to the fact that, naked eye, one could never observe that extremely low contrast silhouette of the crescent against the bright twilight sky. However, the people who keep these records do recognize separate telescope, binocular and naked eye records for these events. For myself, much of the challenge now is to understand what effects such things as temperature, humidity, sky conditions, sky contrast, air pollution, light pollution, even clouds, etc. have on my ability to observe the crescent. I have experimented using various types of filters and have established minimum thresholds of elongation , under different conditions, that one needs to be successful. Now back to my story.

By the time we had reached Luling, it was beginning to appear as if there would be no attempt because we were experiencing almost complete overcast, but

*Continued on page 22...*

# ***Houston Astronomical Society***

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***Meeting Notice  
For Friday, May 7, 1999***

## ***Allan H. Treiman***

***"New Images of Mars from  
the Mars Global Surveyor"***

Allan Treiman is a senior staff scientist at the Lunar and Planetary Institute. Educated in chemistry and geology, Allan got involved in meteorite studies about 15 years ago. This led to investigations of meteorites from Mars, and eventually to Martian geology itself.

**Note: In June we will have a TSP recap.** Anybody who has slides to show or a story to tell, should get in touch with Scott Mitchell (see inside front cover or email STARSCM@aol.com). Scott will be organizing the presentations.

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

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

Jose Sancho and Susan Spore began a new year of novice programs in January. This year the Novice committee will work with you to complete the Messier list.

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

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

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

# May/June Calendar:



<i>Date</i>	<i>Time</i>	<i>Event</i>
<b>May</b>		
5	2:36 a.m.	Reappearance of 21 Sagittarii from Lunar Occultation (see April GS, p.16)
7		HAS Club Meeting
	7:00 p.m.	Novice Presentation - U of H
	8:00 p.m.	General Membership Meeting - U of H
8	12:30 p.m.	Third Quarter Moon
		Members Observatory Night-Columbus
9		Texas Star Party begins - Ft. Davis
15	7:05 a.m.	New Moon
		Prime Night-Columbus
		Texas Star Party ends - Ft. Davis
18	7:00 p.m.	Advanced SIG Mtg.-Rice Univ., contact Bill Flanagan, 713-699-8819
21	11:32 p.m.	Occultation of Regulus by the Moon (see April GS, p.16)
22	12:25 a.m.	Reappearance of Regulus
	12:33 a.m.	First Quarter Moon
30	1:40 a.m.	Full Moon
<b>June</b>		
4		HAS Club Meeting
	7:00 p.m.	Novice Presentation - U of H
	8:00 p.m.	General Membership Meeting - U of H
5		Members Observatory Night-Columbus
7	11:20 p.m.	Moon at Third Quarter
12		Prime Night-Columbus
13	2:03 p.m.	New Moon
15	7:00 p.m.	Advanced SIG Mtg.-Rice Univ., contact Bill Flanagan, 713-699-8819
20	1:11 p.m.	First Quarter Moon
21	2:50 p.m.	Summer Solstice-summer begins
28	4:37 p.m.	Full Moon

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

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# ***The Big Listen***

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*by Clayton Jeter, loaner telescope program  
stonebloke@aol.com*

Thanks to a H.A.S. member with a big heart and a love of astronomy, this member has purchased a new 90mm Orion EQ Refracting telescope for our loaner telescope program.

At January months general meeting he listened closely to my appeal for a refractor that was needed for the telescope inventory. It seems many members have asked for the use of this type of instrument.

Thanks to this generous donor, my request was answered promptly. Our society now has a beautiful and useful refractor sitting upon a German mount. Here are its specifications:

Orion "Skyview" deluxe 90mm (3.5")  
E Q refractor f/11  
6X30 finder  
2 ea. Plossl's 1 1/4"  
25mm (40X) & 9mm (111X)  
Moon filter  
German equatorial mount  
with a built in polar alignment scope.

We now have a full spectrum of loaner telescopes to choose from.. need a Dobsonian for portability, wanna take astrophotos through a C-6 or C-11, how about finding the Messier's, Hershel's or what ever with our 8" Meades?

You can even split double-double stars now with our new Orion 90mm EQ.

Call me for details or grab me at the meeting for a free loaner scope of your choice.

Thanks again for "The Big Listen". Our society listens well.

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## ***Friends of Mike Morton Fund***

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At the March meeting, it was announced that local amateur Mike Morton was undergoing chemo therapy for cancer. A raffle of an 8" telescope was scheduled for May 1, with the donations going to the "Friends of Mike Morton" fund. Since that meeting, Mike unexpectedly died, not from the cancer, but possible complications of the chemo. This will leave his wife, Tracy Knauss, with a financial burden.

The fund is continuing to help pay for the cost of the chemo and other related expenses.

If you would like to contribute to the fund, here is the information:  
You may make your donation at any Bank of America branch.

Make the deposit to:  
Mike Morton  
acct # 5028904898

Donations may be deposited directly into the account or you may mail your donation to:

Mike Morton fund  
c/o Keith Rivich  
1800 Rivercrest Dr #411  
Sugarland Tx 77478-4154  
(281) 491-6797

Make checks payable to "Mike Morton Fund"

All donations received by mail will be promptly deposited into the fund. If you need a receipt showing proof of deposit please include your mailing address, a receipt will be mailed promptly.

This fund is being created and maintained by friends of Mike Morton and Tracy Knauss. Your generous contributions will help Mike and Tracy meet their obligations for medical, home mortgage and other expenses that don't stop just because their primary income stops.

Thank you

*Steve & Amelia Goldberg*

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# ***Advanced Special Interest Group***

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by Matt Delevoryas

The presentation for the May monthly Advanced SIG meeting will be by William Leach, on “Image Processing: The Future of Astronomy.” How does NASA turn raw image data into those beautiful images you see in *Sky and Telescope* and *Astronomy* magazines? The advanced SIG will engage in a two part audience participation seminar on the methods of image processing. Topics covered will include image assessment, scaling, filtering, masking and merging. The software used will include Epoch2000ip and AstroIP. All SIG, and Society, members are encouraged to participate in this journey into the art and science of image processing. Bill Leach, Professor of Physics/Chemistry at Kingwood College, also holds elected positions of distinction in the Society.

All monthly Advanced SIG meetings are held on the second Tuesday after the first Friday. This month’s meeting will begin at 7:30 p.m. on May 18th. Please note that we will be starting the meetings 30 minutes later than we have in the past to allow everyone ample time to arrive. The SIG meetings (and those of all other HAS activities at Rice) are held on the Rice University campus, in room 106 of the Space Science building. The Space Science building is along the long, south, side of the parking lot accessible from Rice entrance 13, Rice Boulevard at Kent. Room 106 is on the east end of the first floor of the building. The program is presented between 7:30 to 8:30, followed by any business and communications, adjournment, and normally a free-for-all astronomical discussion. If you wish any further information on the SIG, call Bill Flanagan, Chairman, at 713-699-8819.

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## ***Want Ads***

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**Found:** Pair of glasses (probably ladies) at Columbus from Messier Marathon night. Outer circle of pads, SE corner by the power plugs. 2 pads to the east from my pad. Call me. Steve Goldberg 713-721-5077.

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# ***Texas Light Pollution Law Pending***

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Many of you are interested in seeing outdoor lighting conditions improve where you live, work, and play!

You felt there wasn't anything you could do about it, right?

TODAY is your day to change that!

There is a new light pollution law being considered by the Texas State Legislature right now. HB 916 has bipartisan support and we need your help to be sure that your state reps hear directly from you that HB 916 should be passed.

HB 916 requires that most light fixtures purchased by the State be fully-shielded. It is an excellent first-step to future legislation, like the excellent law just passed in New Mexico that includes a ban on the sale of mercury vapor lights statewide in NM!

What can YOU do?

1. Pass this information to other interested Texans.
2. Ask your local astronomy club newsletter editor to print this letter.
3. Contact your Texas state Representative (and Senator) and let them know that you want them to support HB 916 on shielding new or replaced state-funded Outdoor Lights. Our experience for years has been that safety, glare, and economies are far more persuasive than astronomy alone.

Please act quickly. Thank you!

For a copy of HB 916, to post a public message of support on our Forum, and for the latest news and information, please visit our website at:  
<http://www.fc.net/~eolc/>

Locate/Contact your State Representative: (postal mail or personal visits are most effective, but not the only way)  
<http://www.house.state.tx.us/house/member.htm>

***Look What New Mexico Did!***

<http://legis.state.nm.us/Sessions/99%20Regular/bills/house/HB39.html>

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# ***Comet 52P/Harrington-Abell***

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*By Matt Delevoryas*

Following is an ephemeris for Comet 52P/Harrington-Abell, continuing the ephemeris in the last *GuideStar*, brought to you by the folks at Starline, with information provided by the IAU Circulars Committee. Do not believe the magnitudes listed. The comet has spent months nearly ten magnitudes brighter than these predictions, and based on a conservative April report, may still be six magnitudes brighter than predicted. (The predictions are based on its normal behavior.) Check Starline (281-568-9340) for information about its current magnitude. During the ephemeris, it starts overhead at twilight and becomes a west-southwesterly object, leaving Cancer for Leo on the 17th. The elements are from MPC 27081, and the magnitude is from the 1990 Comet Handbook (which is also the magnitude still used in MPC 31833). 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							
mm dd	Date	h m	deg mi	h m	deg mi	deg mi	deg mi	deg mi	deg mi			
May 2	2451300.5	8 53.1	+16 30	8 50.3	+16 42	19.0	1.69	1.97				
May 12	2451310.5	9 11.3	+14 26	9 08.6	+14 38	19.3	1.82	2.01				
May 22	2451320.5	9 29.6	+12 21	9 26.8	+12 34	19.7	1.96	2.05				
Jun 1	2451330.5	9 47.7	+10 15	9 45.0	+10 29	20.0	2.11	2.10				

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# **Comet P/1998 U3 Jäger**

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*By Matt Delevoryas*

Following is an ephemeris for Comet P/1998 U3 Jäger, picking up where the ephemeris in the last *GuideStar* left off, brought to you by the folks at Starline, with information provided by the IAU Circulars Committee. During the ephemeris, it is a west-southwest to west evening object moving from Gemini to Cancer on the 3rd. The elements are from MPC 33650, 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				
mm dd	Date	h	m	deg	mi	h	m	deg	mi			
Apr 22	2451290.5	7	36.3	+15	23	7	33.4	+15	30	11.5	2.07	2.17
May 2	2451300.5	7	53.2	+13	43	7	50.4	+13	51	11.6	2.19	2.19
May 12	2451310.5	8	10.7	+12	01	8	07.9	+12	10	11.8	2.32	2.21
May 21	2451319.5	8	26.7	+10	27	8	24.0	+10	37	11.9	2.43	2.24
Jun 1	2451330.5	8	46.4	+08	29	8	43.8	+08	40	12.1	2.56	2.27

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## **HAS Logo Sales**

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*by Judy Ann Dye*

If you are interested in any of the following items and would like to place an order, please contact me (Judy Dye) at 281-498-1703, or send a check for the items requested to 12352 Newbrook, Houston Texas, 77072-3910. Below is the current list of logo items for sale:

WHITE SWEATSHIRT W/BLUE STARS .....	\$ 13.00
GREY HOODED SWEATSHIRT (M to XL) .....	\$ 25.00
*BLUE POCKET T-SHIRT W/LOGO .....	\$ 12.44
22 OUNCE THERMAL CUP .....	\$ 5.00
OBSERVE MESSIER .....	\$ 4.00
OBSERVE COMETS .....	\$ 7.00
OBSERVER'S HANDBOOK .....	\$ 12.00

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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, picking up where the ephemeris in the last *GuideStar* left off, brought to you by the folks at Starline, with information provided by the IAU Circulars Committee. During the ephemeris, it moves from being a high north-northwest morning object to a lower but still well placed west-northwest evening object, in Lynx, passing through Ursa Major for a day on the 2nd, and entering Cancer on the 29th. The elements are from MPC 34126, 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	Julian	J2000.0				B1950.0				Mag	C-E	C-S
		RA	Dec	RA	Dec							
mm dd	Date	h m	deg mi	h m	deg mi	Mag	C-E	C-S				
Apr 24	2451292.5	8 25.8	+53 12	8 22.1	+53 22	10.6	1.95	2.08				
Apr 26	2451294.5	8 27.8	+51 45	8 24.1	+51 55	10.7	1.99	2.10				
Apr 28	2451296.5	8 29.7	+50 20	8 26.0	+50 30	10.8	2.02	2.11				
Apr 30	2451298.5	8 31.6	+48 58	8 28.0	+49 09	10.8	2.06	2.13				
May 2	2451300.5	8 33.5	+47 39	8 30.0	+47 49	10.9	2.10	2.14				
May 4	2451302.5	8 35.4	+46 22	8 31.9	+46 32	11.0	2.14	2.15				
May 6	2451304.5	8 37.3	+45 07	8 33.9	+45 18	11.1	2.18	2.17				
May 8	2451306.5	8 39.2	+43 55	8 35.8	+44 06	11.1	2.21	2.18				
May 10	2451308.5	8 41.1	+42 45	8 37.8	+42 56	11.2	2.26	2.20				
May 12	2451310.5	8 43.0	+41 37	8 39.7	+41 48	11.3	2.30	2.21				
May 14	2451312.5	8 44.9	+40 31	8 41.6	+40 42	11.3	2.34	2.23				
May 16	2451314.5	8 46.8	+39 27	8 43.6	+39 38	11.4	2.38	2.24				
May 18	2451316.5	8 48.7	+38 24	8 45.5	+38 36	11.5	2.42	2.26				
May 20	2451318.5	8 50.6	+37 24	8 47.4	+37 35	11.5	2.46	2.27				
May 22	2451320.5	8 52.5	+36 25	8 49.4	+36 37	11.6	2.50	2.29				
May 24	2451322.5	8 54.4	+35 28	8 51.3	+35 40	11.7	2.55	2.31				
May 26	2451324.5	8 56.3	+34 33	8 53.2	+34 44	11.7	2.59	2.32				
May 28	2451326.5	8 58.2	+33 39	8 55.1	+33 51	11.8	2.63	2.34				
May 30	2451328.5	9 00.1	+32 46	8 57.0	+32 58	11.9	2.67	2.35				
Jun 1	2451330.5	9 02.0	+31 55	8 58.9	+32 07	11.9	2.71	2.37				

# ***Comet C/1998 P1 Williams***

*By Matt Delevoryas*

Following is an ephemeris for Comet C/1998 P1 Williams, picking up where the ephemeris in the last *GuideStar* left off, brought to you by the folks at Starline, with information provided by the IAU Circulars Committee. Although the predicted magnitudes listed are somewhat depressing, reports indicate the comet to be one to two magnitudes brighter than predicted. During the ephemeris, it is a west-northwest evening object, in Auriga. The elements are from MPC 33189, 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 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					
Apr 22	2451290.5	7 13.4	+41 11	7 09.9	+41 16	14.5	2.98	2.87		
Apr 27	2451295.5	7 13.9	+41 02	7 10.4	+41 07	14.6	3.13	2.93		
May 2	2451300.5	7 14.9	+40 54	7 11.4	+41 00	14.8	3.27	2.98		
May 7	2451305.5	7 16.4	+40 47	7 13.0	+40 53	15.0	3.40	3.04		
May 12	2451310.5	7 18.4	+40 41	7 14.9	+40 46	15.1	3.53	3.09		
May 17	2451315.5	7 20.6	+40 35	7 17.2	+40 41	15.3	3.66	3.15		
May 22	2451320.5	7 23.2	+40 30	7 19.7	+40 36	15.4	3.78	3.20		
May 27	2451325.5	7 26.0	+40 26	7 22.5	+40 32	15.6	3.90	3.26		
Jun 1	2451330.5	7 29.0	+40 23	7 25.5	+40 29	15.7	4.01	3.31		



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# The Ten Commandments

(for Amateur Astronomers)

by Steven Sartor

1. Thou shalt have no white light before thee, behind thee, or to the side of thee whilst sharing the night sky with thy fellow stargazers.
2. Thou shalt not love thy telescope more than thy spouse or thy children, as much maybe, but not more.
3. Thou shalt not covet thy neighbors telescope, unless it exceeds in aperture or electronics twice that of thy wildest dreams.
4. Thou shalt not read *Astronomy* or *Sky and Telescope* on company time, for thy employer makes it possible to continue thy astronomical hobby.
5. Thou shalt have at least two telescopes so as to keep thy spouse interested when thy spouse accompanies thee under the night sky.
6. Thou shalt not allow either thy sons or thy daughters to get married during the Holy days of T.S.P.
7. Thou shalt not reveal to thy spouse the true cost of thy telescope collection; only the individual components and that shall be done with great infrequency.
8. Thou shalt not buy thy spouse any lenses, filters, dew shields, maps, charts or any other necessities for Christmas, anniversaries, or birthdays unless thy spouse needs them for their own telescope.
9. Thou shalt not deceive thy spouse into thinking that thee are taking them for a romantic Saturday night drive when indeed thee is heading for the Dark Site.
10. Thou shalt not store thy telescope in thy living room, dining room or bedroom, less thou be sleeping with it full time.

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# ***Astronomical Calculations Using a Spreadsheet***

## ***Kepler's Third Law***

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by Leland A. Dolan

Many of you use spreadsheets in your work, but if you own a PC, you may even have a spreadsheet program on our home computer and not be aware of it. While businesses generally use high-end programs like *Microsoft Excel*, your "home" computer may have a program like *Microsoft Works*, which includes a spreadsheet. In this article, I will assume you have some working knowledge of spreadsheets; namely that it consists of rows and columns, and that each intersection of a row and a column is a *cell*. If you don't fully understand the differences between the three types of data you will type into a cell: *labels*, *numerical data*, and *formulas*, the article will make that clear

The accompanying diagram shows the upper left-hand corner of the "worksheet" (the document you create). However, do not copy from this illustration, since we will use row "C" as an additional row of labels. Each cell is identified by its column letter, followed by its row number. The cell with the heavy border around it is *C3*. This border tells us that this is the "active" cell. To make any cell active, you either "click" on it with a mouse, or use the arrow keys to move to the cell.

	A	B	C	D
1	KEPLER'S THIRD LAW			
2	Planet	Mean Dist.	Period	
3	Earth	1.000		
4	Venus	0.723		
5	Mars	1.524		
6				

You can type data only into an active cell. Make A1 the active cell, and begin by typing "KEPLER'S THIRD LAW". Instead of using the "Enter" key, use the "down arrow" to enter this data. Now is a good time to name the worksheet. I call mine "KEPLAW", but you can name it as you like. Now, type "Planet" (just the word, not the quotation marks) in cell A2. In cells B2 through F2, (respectively) type "Mean Dist.", "Period", "Days per", "Period" and "Synodic". In the third row, in cells B3 through F3, type "A.U.", "Years", "Year", "Days", and "Days". Now, we are going to fill out column A with names of seven of the planets. Beginning at A4, through A10, type "Earth", "Mercury", "Venus",

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## ***...Using a Spreadsheet ...from previous page***

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“Mars”, “Jupiter”, “Saturn”, and “Pluto”. If you wish to complete the list of planets, get the data from an almanac or textbook.

So far, we have entered only *labels*. We will now type *numerical data* in columns ‘B’ and ‘D’. Begin with column ‘D’ since here you will learn how to copy data down a column using a convenient “tool” the *fill handle*. Type “365.25” in cell D4. Enter, and return to D4 and move the cursor over the fill handle. At this time it becomes a “crosshair”. Now click on the fill handle and drag down as far as D10, or beyond. This way we *fill a range of cells* with, the same numerical value. Using the fill handle, you can also fill a range with formulas that are relative to their respective rows, as will be shown in the next paragraph. Now, we type individual numerical data in cells down row ‘B’. Type “1” at B4. Continue by typing the following data in cells B5 through B10: “0.387”, “0.723”, “1.524”, “5.203”, “9.555”, and “39.55”. At this point, it’s a good idea to check the numerical data you typed for accuracy. A misspelled word in a label doesn’t really matter, but incorrect numerical values or incorrect formulas will give incorrect results.

Spreadsheets make mathematical calculations! Although designed primarily for financial calculations (such as profit & loss statements) they can be used for scientific calculations as well. You should be familiar with the arithmetic *operators*. In the MS spreadsheets, always begin your formulas with the equals “=” sign. Choose some blank cells below row 12 and type these examples of addition, subtraction, multiplication, and division: “=5+4”, “=12-9”, “=4\*6”, and “=15/5”. If you typed correctly, instead of displaying exactly what you typed, the respective cells will show “9”, “3”, “24”, and “3”. One thing you might not be familiar with is the “*exponentiation*” operator, represented by “^”, which I call the “rafter”. This is used for powers and roots. As an example: type “=5^2” (meaning “five to the second power” or five squared), and the cell shows “25”. Type “=5^3” (five to the third power) and the result is 125. To take the square root of 100 is the same as “100 to the one-half power”, so type “=100^(1/2)” and the cell shows “10”. In this case the parentheses are absolutely mandatory, or else the computer will think “100 to the first power (that’s 100), divided by two” equals “50”.

I won’t bother to state Kepler’s Third Law, but rather, the formula we use to solve it. Therefore type “=B4^(3/2)” in cell C4. We still get “1”, but it is correct. Now click and drag on the fill handle in C4, and fill the range all the way down to C10. The values (in years) for the rest of column ‘C’ should be in close

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## ***...Using a Spreadsheet ...from previous page***

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agreement with those in the almanac. To convert these values from years to days (for planets with shorter periods) go to E4, and type “=C4\*D4”. Now “grab” the fill handle, drag and fill the range down only as far as E7. As you can see Mercury’s orbital period is only 88 days. Mars takes less than two years or orbit the Sun, but there is something puzzling here. Mars is at opposition now, but the last one was on Mar 17, 1997, and the next on June 13, 2001. Why are oppositions more than two years apart? The orbital periods (shown in column ‘D’ and ‘E’) are Sidereal periods. The interval between successive conjunctions (of Mercury & Venus), or successive oppositions of Mars, Jupiter, etc., are Synodic (suh-NOD-ic) periods. These occur only when another planet, Earth and Sun form are in a “nearly” straight line. We’ll learn how to compute synodic periods in the next paragraph.

Our formulas will be entered into column “F”, but we will not begin a F4. Earth cannot have a synodic period, since all these relative to Earth’s sidereal period. Also, note that we will use a different formula for Mercury & Venus, than for the planets beyond Earth. Furthermore, copy these formulas with the parentheses “( )” exactly as quoted, or else you will get an error message, or incorrect results. So, beginning at cell F5, type “=1/((1/C5)-1)\*D5”. Return to F5, and drag “fill handle” only one row down to F6. Since the remaining planets have sidereal periods longer than Earth’s, we use a different formula in F7. Type “=1/(1-(1/C7))\*D7”. Enter and click on the fill handle in F7, drag and fill the range down to F10, or even farther if you plan to add more planets. The synodic period of Mars is 779.7 or 780 days. If your results differ noticeably from this, then go back and check your formulas. The data in the “active” is displayed in the *Formula Bar* immediately above the spreadsheet.

By now, you see how a spreadsheet can be used in astronomy. If you have questions, you can reach me at: [ladolan@hal-pc.org](mailto:ladolan@hal-pc.org). I am considering Part II of this worksheet, in which we work the formula in reverse. This will be useful for comets, where the period is known and we’ll compute, not only its mean distance, but perihelion distance as well.

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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>

**Northside Astronomical Society** meets at 8:00 p.m. on the 4th Friday of each month in the Teaching Theatre of the Student Center at Kingwood College. Call 281-312-1650 or E-mail [bill.leach@nhmccd.edu](mailto:bill.leach@nhmccd.edu). First organizational meeting: April 23, 1999.

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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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# ***Observatory Duty Roster***

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*by Michael B. Dye, Observatory Chairman*

This is the duty list for May and June. 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.

**May supervisor ..... Logan Rimes ..... 713 681-5397**  
Chai S. Heng ..... Site  
David L. Herlinger ..... Site  
Gary Hlivko ..... Site  
Wayne Hutchinson ..... Members Observatory Night 05-08-99  
Clayton L. Jeter ..... Site  
Stanley G. Jones ..... Members Observatory Night 05-08-99  
Keith A. Jurgens ..... Members Observatory Night 05-08-99  
Arnie Kaestner ..... Site

**June supervisor ..... Matt Delevoryas ..... 713 795-0808**  
David Kahlich ..... Site  
Bill Krell ..... Site  
Jay Levy ..... Site  
Mary Lockwood ..... Members Observatory Night 06-05-99  
Robert C. Menius ..... Site  
Larry Mitchell ..... Members Observatory Night 06-05-99  
John J Mitscherling ..... Members Observatory Night 06-05-99  
Jeff Moore ..... 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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## ***B&Ps from the IAUCs***

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*by Matt Delevoryas*



Another moon has been found in the Solar System. However, this one revolves around not a major planet, but a minor planet. Just as asteroid Ida was found by spacecraft images to have a moon, Dactyl, IAU Circular 7129 reports that the asteroid (45) Eugenia has been found to have a moon, (provisionally) S/1998 (45) 1. However, this moon was discovered from the ground. There has been strong indirect evidence of other asteroids having satellites, but this satellite was clearly observed over 10 days to be orbiting Eugenia in a nearly circular orbit which took it as far as 0.8" from Eugenia. The satellite is about six magnitudes fainter, at least in the near infrared bands used for the observations, with the CFH 3.6m telescope at Mauna Kea.

Speaking of the Solar System observations from the ground, IAU Circulars 6987, 7051, and 7108 reported IR imaging of Neptune with the very same telescope last July 6th. A month after gathering the data, IAUC 6987 was published in August. The most obvious findings were reported, the Neptunian moons VIII, Proteus, VII, Larissa, and VI, Galatea. Two of the moons were where they were expected, but Galatea was about five degrees ahead of where it was expected (a distance Galatea covers in nine minutes). The five University of Hawaii observers suggested this was due to interaction with Neptune's Adams (the outermost, main) ring, as had already been discussed in articles in *Icarus*. The researchers set to work in earnest processing their images. In November, IAUC 7051 announced that the images also showed Neptune V, Despina (which was pretty much where it was expected), and the Adams ring arcs. The three main arcs (Liberte, Egalite, and Fraternite) were definitely seen, at locations consistent with one prediction of their motions. In February, IAUC 7108 reported that the researchers had analyzed their images still more, and believe they found a new partial ring structure at the distance of the previously known Le Verrier ring, but twice the brightness of the Adams arcs. It's amazing what you can get out of an image if you work hard enough looking at it.

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February's article (p. 22) mentioned the continuing brightening of R Coronae Borealis, suggesting a return to its normal magnitude 6 around the end of February. Naturally, once that article was in print, IAU Circular 7096 announced that the star had spent most of January fading to the faintest in this period of activity, practically 10.0! The IAUCs then went silent again, but other reports show it has irregularly brightened most of the way to its normal magnitude, with magnitudes in the mid sixes for the first week of April. This suggests ending April almost at normal brightness and spending May slowly returning completely to normal. Of course, now that this is in print, something, anything, unexpected probably will happen. Check Starline to see what it is. See the December article (pp. 16-17) 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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## ***President's Message... from page 4***

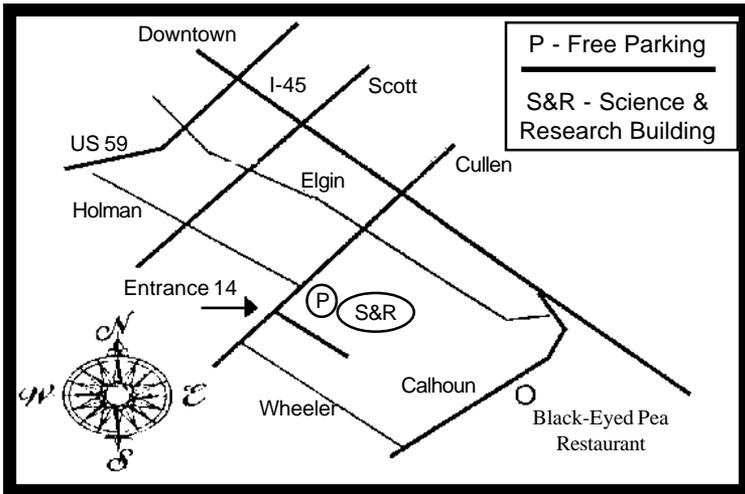
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then, at San Antonio, the clouds were rapidly dissipating in the west and hope returned. Unfortunately, to the northwest, the direction I-10 takes you, there was still thick cloud cover. As we headed in that direction, I began to regret that we had not headed towards Del Rio, but then, gradually, I detected clearing to the west and northwest. By the time we reached Kerrville, it was almost entirely clear, and we set up about four miles west of the Kerrville exit, not a minute too soon, as sunset was rapidly approaching. At 8:07 p.m. I acquired the crescent, a slender arc less than 90 degrees in length, and only two minutes after sunset (which I consider good for this elongation) for a 20hr. and 45 min. young Moon. Chris then observed it in his binoculars at 8:09 It was already a good trip.

Afterwards, we headed towards McKavett, where I set up a 13-inch telescope under very dark skies. I want to thank Hernan Contraras for help in leading me into the site with a red light, and also for all his hospitality. On Saturday I headed to Krause Springs where I enjoyed a few hours with the ever zany and always friendly Fort Benders.

Clear skies and le croissant lunaire

*Don Pearce*



### **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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