

SJAA EPHEMERIS

Dante's Astronomy

Peter Lord

Dante's great masterpiece *The Divine Comedy* embodies a transcendental form of astronomy. Each of the three books of this epic medieval work begins with the upward look to the heavens in Greek tradition of the astronomer/philosopher. Just as significantly, each of the three books ends with the word *Stelle*, or stars. The last thought that this great poet leaves the reader with, is that his mind



Dante and Beatrice reach the sun. Giovanni di Paolo, 1403 - 1483.

revolves with the love that moves "the sun, the moon, and other stars." There is no question that *The Divine Comedy* was conceived by a genius aflame with the passions that inspire amateur astronomers to this day; aperture fever is something Dante Alighiere would have understood completely.

To fully appreciate Dante's use of astronomy, we need to remember that 700 years ago astronomy and philosophy remained tightly integrated within the liberal arts of the first universities Oxford and Paris. This was the astronomy of Ptolemy, preserved by the works of Arab astronomers, a legacy that lives today in names such as Deneb, Aldebaran, and Alfraganus.

Dante's pre-Copernican astronomy, was essentially a Greek system in which the stars and planets rode across the heavens on crystalline spheres set in motion by the hand of God. It was a pure form of naked eye astronomy, philosophically born of the primal human urge to explore, an impulse we still feel today as we look up at the stars and question the meaning of our existence.

Dante's astronomy brings to life the ancient philosophical tradition that looking to the stars in contemplation transforms and elevates the mind. Perhaps the finest example of this occurs in the beginning of Dante's

second book, *The Purgatory*. Here after emerging from the subterranean confines of Hell (where one cannot look at the stars) Dante and his mentor Virgil pause from their climb up the mountain of Purgatory. They rest on an East-facing ledge in the early hours after dawn. Dante reveals his observational skills by noticing something unusual about the path of the sun through the sky. He turns to Virgil in amazement, perplexed that the sun is moving to the left of the meridian. Dante who started his journey in the northern hemisphere expects to see

Continued on next page

SJAA Activities Calendar

Jim Van Nuland

September

- 7** Deep sky Weekend. Sunset 7:26 p.m., 2% moon sets 8:17 p.m.
- 13** Houge Park star party. Sunset 7:18 p.m., 55% moon sets 0:03 a.m.
- 14** ATM Class XVI. Houge Park, 7:30 p.m.
- 21** **General Meeting:** Slide and Equipment night. Houge Park, 8:00 p.m.
- 26** ATM Class XVII. Houge Park, 7:30 p.m.
- 27** Astronomy Class X, *Cosmic Bird Watching*, Jay Reynolds Freeman. Houge Park, 7:30 p.m.
- 27** Houge Park star party. Sunset 6:57 p.m., 65% moon rise 10:31 p.m.
- 28** Short Deep sky Weekend. Sunset 6:54 p.m., 56% moon rise 11:15 p.m.

October

- 3-6** CALSTAR star party at Lake San Antonio County Park
- 11** Houge Park star party. Sunset 6:36 p.m., 39% moon sets 12:49 p.m.
- 12** ATM Class XVIII. Houge Park, 7:30 p.m.
- 19** **General Meeting:** Br. Guy Consolmagno, Vatican Observatory. Houge Park, 8:00 p.m.
- 24** ATM Class XIX. Houge Park, 7:30 p.m.
- 26** Short Deep sky Weekend. Sunset 6:15 p.m., 71% moon rise 10:01 p.m.
- 27** Daylight Savings Time ends. Turn 2:00 a.m. back to 1:00 a.m., take extra hour observing.

24 Hour News and Information Hotline: (408) 559-1221

www.sjaa.net

Dante's Astronomy

Continued from previous page

the sun moving to his right, to the south of the meridian. Within the works that Dante studied was a reverence for the fact (considered highly philosophical in a world without satellites) that the heavens appear to behave differently from different vantage points on a spherical earth. What Dante is coming to terms with is that his subterranean journey across hell took him straight through the earth, past its center, and up into the southern hemisphere.

Virgil asks Dante to remember all that he studied, then work out the significance of what he is seeing. In a sudden flash of understanding any amateur astronomer knows well, Dante "gets it:" he is seeing the motion of the sun from the other side of the world! As soon as Dante turns his mental worldview upside-down, it all makes sense. Dante brings to life the power of astronomy to transform our worldview (the very foundation of our experience of life on planet Earth) through poetry.

A second remarkable example can be found in *The Paradiso* as Dante reaches the crystalline sphere that carries the sun. Here, he pauses to gaze lovingly on the geometric points of the equinox before him. Describing with mathematical skill the intersection of the ecliptic with the other great circles of the Ptolemaic astronomy. Dante fills his poetry with

the appreciation that the skewed relationship of the circles is the cause of the Earth's seasons.

The Divine Comedy reminds us not only of the tremendous power of visual astronomy to inspire us; it also reminds us that the wonder and inspiration that we find in astronomy links us to some of the deepest philosophical questions of the western tradition. The Divine Comedy further entices us with the prospect of entering into this tradition through our own education. The light of Dante's intellect has the power to transform our own upward gaze to the stars into a

Amateur astronomers are heirs to an epic legacy of personal exploration

celebration of our shared humanity. Amateur astronomers are heirs to an epic legacy of personal exploration, hidden in one of the foremost works of western literature, waiting to be noticed like the stars above.

— Peter Lord, pllord@attbi.com

[Editor's Note: Peter Lord is a long time member of SJAA, PAS, and other Bay Area astronomy clubs, a spacecraft engineer for Loral, and recent recipient of a Masters of Liberal Arts from Stanford. His thesis explored the astronomy in Dante's Divine Comedy.]

ASTRONOMY Magazine Renewal Time

Jim Van Nuland

It's time to renew our group subscription to Astronomy magazine. The rate for 2003 is again \$29, or \$55 for two years. Please send a check payable to Jim Van Nuland, 3509 Calico Ave., San Jose CA 95124.

If you subscribe independently, and your subscription ends during 2003, you may convert to the group rate. Send a check and the renewal card or a mailing label to Jim, and you'll be added to the group for an

additional 12/24 months.

If you do not subscribe and wish to do so, send the \$29/55 and your subscription will begin with the January 2003 issue.

I will hold your checks until early October when the renewal package is sent in. Don't worry that your check doesn't clear promptly.

Any questions? Call Jim at 408.371.1307, from 10 a.m. to 10 p.m., or e-mail to jvn@svpal.org.

Bro. Guy Consolmagno to Speak at October Meeting

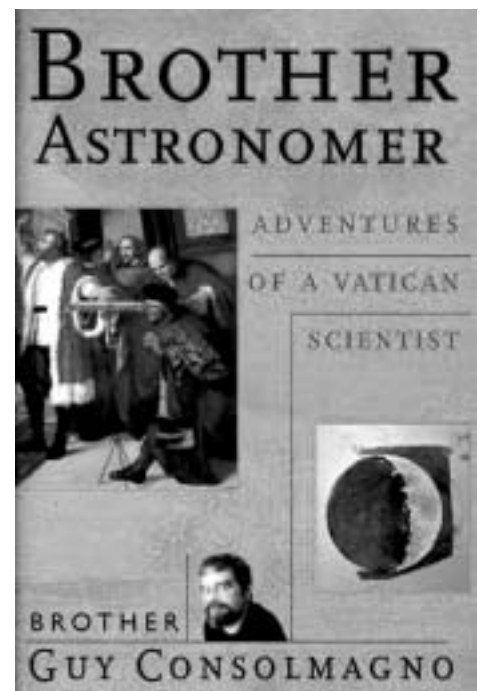
Our speaker for the October general meeting will be Brother Guy Consolmagno, author of *Turn Left at Orion* and *Brother Astronomer: Adventures of a Vatican Scientist*.

Brother Guy has been at the Vatican Observatory since 1993 and splits his time between two homes. In the summer, he lives at Castel Gandolfo, Italy (summer home of the Pope), where he is the curator for the Vatican meteorites. In the winter, he lives in Tucson, Arizona, where he observes asteroids and Kuiper Belt comets with the Vatican's 1.8 meter telescope on Mt. Graham

He has taught in Africa as a Peace Corps volunteer and has searched for meteorites in Antarctica.

He is a renowned speaker, able to talk about the philosophy of science and religion and the commonality he views between them.

See next month's Ephemeris for Brother Guy's topic. Both books will be available for sale and for Brother Guy to sign at the October meeting.

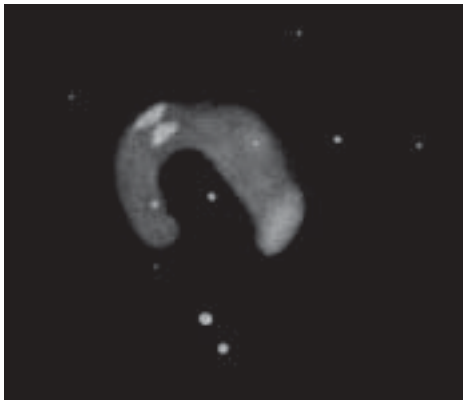


Milky Way from Fremont Peak

Mark Wagner

This month's new moon is the last for summer 2002. Night time temps are already heading lower and fall's crisp evenings are on approach. Take this opportunity to visit one of the higher local dark sky sites while weather conditions make them attractive.

Fremont Peak State Park is the venerable observing heart of amateur astronomy in the greater South San Francisco Bay Area, and beyond. The "Peak" is a beautiful setting for our hobby. Enjoy a picnic or BBQ dinner



NGC7008 in Cygnus sketched by Mark Birkmann, 408X through 40-inch Newtonian with Orion Ultrablock filter

under old oaks while enjoying the spectacular sunsets over a coastline spanning from Santa Cruz to Monterey bay. If the fog is in over the coastal plain the effect is surreal, and what a treat you'll be in for when night brings out mag 6+ skies! At 2,600 feet, the Peak is one of the higher local perches from which to observe.

There are several spots ... the southwest lot, just below the Peak trail, along Coulter Row, or if you are an FPOA member up by the observatory (check with FPOA for current access rules). Each location has its own unique attributes. And as an added bonus, if the observatory is open you can enjoy views through the 30" Newtonian "Challenger." Even the 11 mile drive up San Juan Canyon Road

out of San Juan Bautista is worth the trip ... a beautiful drive to an island of amateur astronomy, less than an hour south of San Jose!

This month's deep sky targets sit between right ascension 21 and 23, placed comfortably rising in the east for two hours after astronomical dark on new moon (September 6).

Start with the interesting planetary nebula NGC7027 in Cygnus. This is a bright object at mag 8.5 and

Now let's jump far outside to a galaxy that looks much like our own

only 3600 light years distant. My notes describe it as an "easy target close to two bright stars E of Deneb. Fuzzy at 70x. At 195x the planetary begins to show elongation and its bi-lobed shape. At 350x it is clearly bi-lobed and a gray-green. The west end is a bit larger and notably brighter. A star may be embedded in the extreme western end."

While you are near NGC7027, if you are under dark skies pop in an Ultra High Contrast (UHC) filter and lowest power eyepiece for a cruise along NGC7000, the North American Nebula, and perhaps if you're lucky the Pelican Nebula as well.

NGC7008 is a mag 13.0 planetary nebula. This one is barely in Cygnus, but is a remarkable object worth hunting down. Use Deneb (Alpha Cygni) and Alpha Cephei (Alderamin) as the guide stars. At 170X using an Orion Ultrablock filter the object appeared annular and elongated slightly NNE-SSW. A very bright knot was on the northern edge with a pair of stars almost touching the southern edge. This is a great target for dark skies and more magnification!

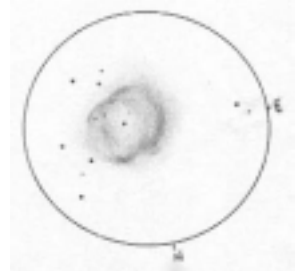
NGC7092 is better known as M39. This is a dazzling open cluster. Its 35' diameter nearly fills the field of

view in my 20 Nagler. I called it a "poor-man's M45" in my notes. This one is easy to see in a modest finder 9 degrees east northeast of Deneb. Look at two more open clusters in the immediate area while visiting M39. NGC7067 is a small rich cluster less than one and a half degrees southwest of M39. Some literature refers to nebulosity around this object, can you detect any? Finally head just over one degree southeast from NGC7067 to NGC7082, an open cluster nearly as large as M39, and bright, but scattered — somewhat of a poor cluster, but offering you some variety and gives a better appreciation of the big Messier nearby.

You may be surprised to learn that the next object is visible even from Houge Park on a good (moonless) night! NGC7293 is nearly the size of the full moon. Better known as the Helix

Nebula, this object was for decades described as a challenge object for amateur astronomers. With today's larger apertures

and specialty filters such as a UHC, getting good views of the Helix has become trivial. This is the closest and largest (apparent size) planetary nebula in our skies and the view can be stunning. On good nights you can detect what appears as two rings, one overlaying the other, giving an impression of the helical structure for which the object is named. To find this, a good bet is to start with a binocular — the low surface brightness of the Helix shows



NGC7293, the Helix Nebula in Aquarius. sketched by Bill Ferris, 63x through 10-inch Newtonian with O-III filter.

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Out There

Continued from previous page

up much more readily in a 7x or 10x binocular than it does with higher magnification in an unfiltered telescope.

So far all objects have been part of our home Milky Way galaxy. Now let's jump far outside to a galaxy that looks much like our own, NGC7331 in Pegasus. I use it as a target to gauge transparency from home near Houge Park in my 8" and 10" telescopes. If I can detect NGC7331 easily, I am in for a good night! NGC7331 is bright, pretty large, very elongated and nearly edge on. Maybe you can see some dust lanes. All this from our vantage point only 48 million light years away! Several other challenging galaxies dot the neighborhood and make good dark sky targets — NGC7335, 7340 and 7337 form a triangle east of NGC7331 and in the same field of view. Move 30 minutes south-southwest of 7331 and check out Stephan's Quintet. This small interacting group of galaxies can be detected in small apertures, but to get all five members you will need high magnification and dark, dark transparent skies.

When the fog comes in around Fremont Peak, there is no rival in the bay area. Steadiness, transparency, dark skies — the Peak has it all. It is

the right type of place for a deep sky observer to hunt quarry such as Stephan's Quintet or to pluck out the fine details of the Helix or NGC7027. I hope you get out there while the weather permits. Enjoy that sunset

over the fog-covered Pacific and the friendship you'll find sharing views with other observers you'll find at Fremont Peak.

— Mark Wagner,
mgw@resource-intl.com

Mooning

I write history notes, I write about looking for this rille or that, I write about ... well, the wrong things, I sometimes think. And this has been a month to remind me.

I've been getting a bunch of questions, both at public events and through email. So I thought I'd address some of those questions here, with the idea that lots of folks might be curious, but not ask.

Maybe my favorite was: what are those dark marks on the Moon?

Dark marks? Ah. You mean the maria? The dark parts of the man/bunny on the Moon?

Yeah.

In the end, you get a Mare. But why is the stuff that leaks out so dark?

Okay. The maria are not only darker than most of the Moon, they're smoother. And that's because they got rougher treatment!

Basically, they're lava grit. And most lava is made of basalt both here and on the Moon — and it's dark.

Why lava?

Because the maria are situated where Really Big Things hit the Moon back when it was in the latest stages of its formation. Actually, pretty much formed.

When you consider that one of the more recent ones, Imbrium, is 1250km (about 775 miles) across, you get some idea of how big the "incom-

ing" was (probably on the order of 100 miles in diameter at least).

If that hit us now, of course, it would be the end of the world.

So anyway, this big honker touches down, blows what seems to be half the Moon into the sky, and everything settles down, but in the middle we have a big glowing lake of lava.

After a while, that all cools down, but basically the surface is a weakened, sunken, fractured mess. Over perhaps the next few million years repeated lava flows fill in the whole area, layer by layer.

In the end, you get a Mare. But why is the stuff that leaks out so dark?

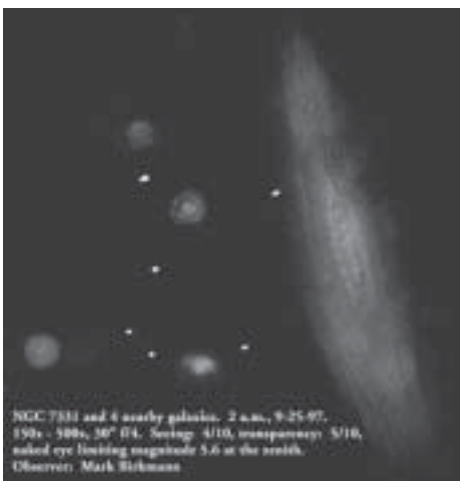
Iron, basically. It has a higher iron content than the lighter (in both senses of the word) upper crustal matter, which has a lot more silica. The lighter stuff is called silicic, and the darker mafic (from magnesium and iron — ferric being a greekism for iron. Note its symbol in the Periodic Table is Fe).

So that's about it ... wait! You said lava "grit." Why grit?

Okay, it's been there (in most cases) for a few billion years now, and during that time all manner of micrometeorites, cosmic rays, pebbles and other crud have been slowly grinding away at it.

Basaltic lavas are crumbly to begin with (you can crunch them with your foot just walking across a lava flow) and now they've been reduced to

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NGC7331 in Pegasus, sketched by Mark Birkmann, 30-inch Newtonian

Mooning

Continued from previous page

dust and grit — but it's still darker than the surrounding silicic "upland" soil.

But wait, Dave! You said "latest stages of formation" and went on to say Imbrium was one of the more recent ... why?

Okay, it's not like this kind of thing didn't happen all along. But when the planetoid was a lot more plastic, it was just like tossing pebbles into a pond. Once it started to "set," they left more of a mark. But even those are mostly obliterated by what came later. Finally, when it was getting really solid, the lighter stuff settled on the top (the brighter, primarily silicic soil). All this flowing and drying kind of erased the early impacts.

So we see now what happened after things settled down enough to let the wounds stick around.

Well, fine Dave. Then if the Maria were caused by big impacts, why don't they look like craters? That's an easy one to answer, but it comes in two parts. The first part is: they do, sort of. A great example is Mare Orientale (the Eastern Sea on the western edge of the Moon — the nomenclature was changed, reversing east and west from the old system, so astronauts wouldn't be confused when they landed. Really!)

But Orientale is hard to see (this is a good time of year to look for it just before full Moon) so here's a better one: Mare Nectaris. You can see it in good light a few days after new and/or full, and nearby you'll see Rupes Altai — or the more prosaic Altai Scarp. That's pretty much like a crater rim, only different.

Different? Well, yeah. Craters act differently depending on what size they are. Little ones will look like the 'cup' after which they are named (crater is descended from the Greek for cup). Somewhat larger ones will flatten out at the bottom and have a raised rim with terraces. A bit larger and they get central peaks. Keep going and you get a mare, which will typically be flattish, but have "shock

rings" around it — like the Altai Scarp.

So Dave, did they really think there were seas on the Moon?

No.

Well, I'm not really sure. Maybe I'll try to find out.

So, this is fun. If anybody actually sends me a question — email north@znet.com — I'll try to answer it here! Maybe if y'all tell me what to write, I'll do a better job.

— Dave North, north@znet.com

Teaching Astronomy with Project Astro

Bob Havner

This past year I became involved with Project Astro. Project Astro is a program operated by the Astronomical Society of the Pacific that pairs 4th through 9th grade teachers with local amateur and professional astronomers. I first heard about Project Astro at the Silicon Valley Lectures at Foothill College. I was interested but also unsure whether I had the skills to teach astronomy, or anything else for that matter, to schoolchildren.



SJAA Veep Bob Havner demonstrates moon phases with his Project Astro class.

I thought about it off and on for some time but there was always that fear of failure. Then I became involved with Jim Van Nuland and the school star parties. I found that I was quite at ease with the kids and they were very interested in what I had to tell them. I also talked to Jane Houston Jones, who I knew was a Project Astro astronomer; she gave me the courage to take the next step.

I attended the Project Astro workshop in the summer of 2001. There I met my Project Astro partner Juanita Ryan. Juanita is a fifth grade teacher at Toyon Elementary School in

San Jose and a veteran to Project Astro. The ASP put on a great workshop. It was two days of hands on projects and instruction on how to have a successful partnership. Everyone was given a copy of *The Universe at your Fingertips*, a complete resource with projects for every area of astronomy at the 4th through 9th level.

Although a minimum of four visits to the school per year are required of the Project Astro astronomer I thought

we should try for once a month. We didn't make that goal but we did have about 7 or 8 meetings including a school star party for the entire school and an attempt at Science Camp that was unfortunately clouded out. As a finale to the year, most of the class showed up at Houge Park for the solar eclipse in June. The class presented me with a scrapbook that has photos, drawings, and letters from the class.

My involvement with my Project Astro class has been one of the most rewarding experiences of my life and I would encourage anyone to take that first step. I plan to continue my partnership with Juanita and I look forward to starting class next year.

— Bob Havner,
bhavner@earthlink.net

***SJAA membership for July:
291, up three from last month.***

Calstar October 3, 4, 5 2002

The SJAA hosts the California Star Party again in 2002. Held at Lake San Antonio, near Paso Robles in Monterey County, Calstar is your basic end of season dark sky star party. No vendors, no food concessions, no speakers, no prizes. Bring water, bring shade and bring sunscreen. And don't

forget to bring your telescope! Camping costs are \$32.00 for the three nights, with an option to camp Sunday night for \$16.00

Maps, registration, and pictures from last years star party are here:
<http://www.sjaa.net/calstar2002.html>



Group picture from the 2001 Calstar gathering at Lake San Antonio.

School and Public Events

- Sep. 5** Waldon West, Saratoga (training session for park personnel)
- Sep. 10** Waldon West, Saratoga (first night walk, assist)
- Sep. 14** Almaden Lake Park, San Jose
- Sep. 22** Overfelt Gardens park, S.J. Moon festival, daytime/sun



Next month: Saturn returns to the evening sky, and the Shallow Sky column returns to the Ephemeris!

Directions to Houge Park

Houge (rhymes with "Yogi") Park is in San Jose, near Campbell and Los Gatos. From Hwy. 17, take the Camden Avenue exit. Go east 0.4 miles, and turn right at the light, onto Bascom Avenue. At the next light, turn left onto Woodard Road. At the first stop sign, turn right onto Twilight Drive. Go three blocks, cross Sunrise Drive, then turn left into the park.

From Hwy. 85, take the Bascom Avenue exit. Go north, and turn right at the first traffic light, onto White Oaks Road. At the first stop sign, turn left onto Twilight Drive. You will now be passing the park. Turn right at the first driveway, into the parking lot.

Celestial Calendar September 2002 Richard Stanton

Lunar Phases:	Date	Rise	Trans	Set
NM	20:07 PDT	06	06:00	12:58 19:45
FQ	11:07 PDT	13	14:23	19:16 00:41
FM	06:58 PDT	21	19:36	00:59 06:53
LQ	10:02 PDT	29	00:12	06:56 14:35

Nearer Planets:	R.A.	Dec.
Mercury, 0.70 A.U., Mag. 2.1		
07 08:55 14:36 20:16	12:34.0	-07:09
17 08:27 14:02 19:37	12:41.0	-08:49
27 07:05 12:54 18:44	12:13.9	-04:29

Venus, 0.48 A.U., Mag. -5.5		
07 10:30 15:46 21:02	13:43.6	-14:36
17 10:30 15:34 20:37	14:11.0	-08:49
27 10:22 15:15 20:07	14:31.9	-21:13

Mars, 2.63 A.U., Mag. 1.7		
07 05:56 12:33 19:10	10:30.9	+10:34
17 05:48 12:18 18:46	10:54.8	+08:10
27 05:41 12:02 18:23	11:18.4	+05:41

Jupiter, 5.93 A.U., Mag. 2.0		
07 03:38 10:43 17:47	08:41.0	+18:44
17 03:08 10:11 17:14	08:48.9	+18:15
27 02:38 09:39 16:40	08:56.2	+17:47

Saturn, 9.06 A.U., Mag. 0.7		
07 00:36 07:53 15:11	05:51.3	+22:08
17 23:55 07:16 14:34	05:53.6	+22:08
27 23:17 06:38 13:56	05:55.1	+22:08

SOL Star Type G2V Intelligent Life in System ?	Hours of Darkness
08:13 07 06:41 13:06 19:29 11:02.7	+06:07
08:41 17 06:50 13:02 19:14 11:38.6	+02:19
09:08 27 06:59 12:59 18:58 12:14.6	-01:35

Astronomical Twilight:	Begin	End
JD 2,452,524 07	05:12	20:58
534 17	05:22	20:41
544 27	05:32	20:24

Sidereal Time:	Transit Right Ascension at Local Midnight
07 00:00 = 21:57	
17 00:00 = 22:36	
27 00:00 = 23:15	

Darkest Saturday Night: 07 Sep 2002	
Sunset	19:29
Twilight	20:58
Moon Set	20:20
Dawn Begin	05:12
Hours Dark	08:13

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Dir Jim Bartolini (831) 394-7795
Dir Paul Mancuso (408) 946-0738
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Dir Steve Nelson (650) 968-4733

Ephemeris Staff

Editors Jane Houston Jones &
Morris Jones (415) 453-2885

Circulation

Bob Brauer (408) 292-7695
Lew Kurtz (408) 739-7106
Dave North

Printing Accuprint (408) 287-7200

School Star Party Chairman

Jim Van Nuland (408) 371-1307

Telescope Loaner Program

Mike Koop (408) 446-0310

Web Page

Bill Arnett bill@nineplanets.org

SJAA Email Addresses

Board of Directors board@sjaa.net
Announcements announce@sjaa.net
Chat List chat@sjaa.net
Ephemeris ephemeris@sjaa.net
Circulation circulation@sjaa.net
Telescope Loaners loaner@sjaa.net
Members Email Lists:
<http://www.sjaa.net/mailman/listinfo>

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Submit

Submit articles for publication in the SJAA Ephemeris. Send articles to the editors via e-mail to ephemeris@sjaa.net.

SJAA Loaner Scope Status

All scopes are available to any SJAA member; contact Mike Koop by email (loaner@sjaa.net) or by phone at work (408) 473-6315 or home (408) 446-0310 (Leave message).

Available Scopes

These are scopes that are available for immediate loan, stored at other SJAA members homes. If you are interested in borrowing one of these scopes, please contact Mike Koop for a scope pick up at any of the listed SJAA events.

# Scope	Description	Stored by
1	4.5" Newt/ P Mount	Annette Reyes
15	8" Dobson	Kirkland Foo
23	6" Newt/P Mount	Wensheng Hua
24	60mm Refractor	Al Kestler
26	11" Dobson	Tajinder Singh
27	13" Dobson	Gene Schmidt
32	6" f/7 Dobson	Sandy Mohan
33	10" Deep Space Explorer	Sandy Mohan

Scope Loans

These are scopes that have been recently loaned out. If you are interested in borrowing one of these scopes, you will be placed on the waiting list until the scope becomes available after the due date.

# Scope	Description	Borrower	Due Date
8	14" Dobson	Jan Lynch	9/15/02
11	Orion XT6 Dob	Tod Irwin	8/17/02
12	Orion XT8 Dob	Rajeev Joshi	10/19/02
13	Orion XT6 Dob	Mark Ziebarth	10/19/02
16	Solar Scope	Bob Havner	8/18/02
36	Celestron 8" f/6 Skyhopper	Tajinder Singh	9/27/02

Extended Scope Loans

These are scopes that have had their loan period extended. If you are interested in borrowing one of these scopes, we will contact the current borrower and try to work out a reasonable transfer time for both parties.

# Scope	Description	Borrower	Due Date
2	6" f/9 Dob	John Paul De Silva	?
3	4" Quantum S/C	Hsin I Huang	10/8/02
6	8" Celestron S/C	Carl Ching	9/23/02
7	12.5" Dobson	Michael Lagae	10/19/02
9	C-11 Compustar	Paul Barton	Indefinite
10	Star Spectroscope	Lew Kurtz	8/23/02
14	8" f/8.5 Dob	John Templeton	10/5/02
19	6" Newt/P Mount	Peter Yoon	10/27/02
21	10" Dobson	Ralph Seguin	Repair
28	13" Dobson	Michael Dajewski	10/31/02
29	C8, Astrophotography	Mike Macedo	11/17/02
34	Dynamax 8" S/C	Phil Chambers	Repair
35	Meade 8" Equatorial	Richard Savage	7/28/02

Waiting List:

3	4" Quantum S/C	Eric Anderson
8	14" Dobson	Doug Hendrix
13	Orion XT6 Dob	Lakshminarasimhan Venkatavaradan
16	Solar Scope	Suzanne P.
32	6" f/7 Dobson	Vinod Nagarajan

San Jose Astronomical Association Membership Form

New ___ Renewal ___

Membership - \$15

Junior (younger than 18 years old) - \$6

Sky and Telescope - add \$30 to membership

(Sky & Tel will not accept multiyear subscriptions)

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San Jose Astronomical Association

P.O. Box 28243

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SAN JOSE, CALIFORNIA

September 21: Slide and Equipment Night
Bring your toys to show off!