

SJAA EPHEMERIS

A study of the *Galaxy Song* by Eric Idle

Paul Kohlmiller

Eric Idle, Monty Python player extraordinaire, wrote the *Galaxy Song* for the movie *The Meaning of Life*. I was quite curious to see how it has withstood 20 years of astronomical leaps in our understanding of the universe. My references can be found at <http://www.softwarerepair.com/astro/ReferencesforGalaxySong.htm>.

Just remember that you're standing on a planet that's evolving

While still controversial in some areas, evolution seems pretty well established.

And revolving at nine hundred miles an hour,

The speed of the earth's revolution is

once per day (duh) but at the equator the circumference of the earth is 25,000 miles so that makes the speed just over 1,000 miles per hour. However, by the time you get as far north as the UK (Eric Idle's country) the speed is actually less than 700 miles per hour. The 900 figure might be good enough for our purposes.

That's orbiting at nineteen miles a second, so it's reckoned,

The earth orbits the sun at 29km/second and there is roughly a 3:2 ratio between kilometers and miles so 19 miles per second is pretty close.

A sun that is the source of all our power.

This may be a bit of hyperbole. The sun is responsible for all wind and solar power and because our weather depends on the sun we would include

hydroelectric power as well. Oil and coal formed as a result of sun-driven processes on earth so that's okay. But this particular sun did not create uranium so it could be argued that it doesn't supply all of our power. IMHO.

The sun and you and me and all the stars that we can see

Are moving at a million miles a day

The sun (and therefore the earth and at least all the stars that you can see with the naked eye) are moving through the galaxy at 225km/sec. This comes out to more than 6 million miles per day.

In an outer spiral arm, at forty thousand miles an hour,

We are indeed in an outer spiral arm of the galaxy. If we were moving at a million miles per day that would come out to 40,000 miles an hour. If the number is closer to 6 million miles per day that makes it close to 250,000 MPH.

Of the galaxy we call the 'Milky Way'. Our galaxy itself contains a hundred billion stars.

While there have been some estimates that are a bit higher than 100 billion stars, this is still a pretty good estimate.

It's a hundred thousand light years side to side.

Give or take 20,000 light years, this is close to the current estimate.

"And pray that there's intelligent life somewhere up in space ..."

Continued on next page

SJAA Activities Calendar

Jim Van Nuland

December

- 6 General meeting at Hoge Park 8:00 p.m. Dr. Jeff Moore, NASA, on the Pluto mission
- 18 ATM class. Hoge Park, 7:30 p.m.
- 19 Hoge Park star party. Sunset 4:53 p.m., 15% moon rises 4:08 a.m.
- 20 Deep sky weekend. Sunset 4:53 p.m., 5% moon rises 5:25 a.m.
- 27 Deep sky weekend. Sunset 4:57 p.m., 29% moon sets 10:00 p.m.

January

- 2 Hoge Park star party. Sunset 5:02 p.m., 77% moon sets 4:01 a.m. Star party hours: 7 to 10 p.m.
- 3 ATM class at Hoge Park. 7:30 p.m.
- 10 General meeting, Dr. Elinor Gates, Lick Observatory, speaks on adaptive optics.
- 15 ATM class at Hoge Park. 7:30 p.m.
- 16 Hoge Park star party. Sunset 5:15 p.m., 26% moon rise 3:03 a.m. Star party hours: 7 to 10 p.m.
- 16 Astronomy class at Hoge Park. 7:30 p.m.
- 17 Deep-sky weekend. Sunset 5:16 p.m., 17% moon rise 4:18 a.m.
- 24 Deep-Sky weekend. Sunset 5:23 p.m., 8% moon sets 8:47 p.m.
- 30 Hoge Park star party. Sunset 5:30 p.m., 70% moon sets 2:51 a.m. Star party hours: 7 to 10 p.m.
- 31 ATM Class at Hoge Park. 7:30 p.m.

The Board of Directors meets at 6:30 p.m. preceding each general meeting. All are welcome.

24 hour news and information hotline: (408) 559-1221

<http://www.sjaa.net>

Galaxy Song

Continued from previous page

It bulges in the middle, sixteen thousand light years thick,

Estimates vary quite a bit but 10-30 thousand light years is at least one estimate for the middle of the galaxy

But out by us, it's just three thousand light years wide.

And in the outer arms it is anywhere from 1 to 10 thousand light years wide.

We're thirty thousand light years from galactic central point.

A very good estimate.

We go 'round every two hundred million years,

Rounding down to the nearest hundred million, this will do nicely.

And our galaxy is only one of millions of billions

Millions of billions would be quite a lot. Some estimates are in excess of 1 trillion galaxies but that's only thousands of billions. But we aren't done counting yet.

In this amazing and expanding universe.

And probably expanding at a faster rate than before.

The universe itself keeps on expanding

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.

and expanding

In all of the directions it can whiz

We have pretty solid proof of that these days

As fast as it can go, at the speed of light, you know,

But matter cannot generally move at the speed of light so the speed of the expansion is somewhat less. On the other hand, there was a time in the early universe where it seems it did expand at a speed greater than the speed of light.

Twelve million miles a minute, and that's the fastest speed there is.

The speed of light is about 186,000 miles per second or just a bit shy of 12 million miles a minute. There are claims for things that can go faster

Mooning

The Cassini Division

Dave North

Cassini is that goofy-looking crater just a bit north of the AAA — Aristillus, Autolycus and Archimedes — on the east edge of Imbrium.

Goofy? You bet.

It's old and beat up, flooded with lava, and has since taken two solid hits, leaving it with a pair of chunky child craters on its floor.

So of course it's one of my favorites. In the right light, it ends up looking whimsical: the comic relief in an otherwise pretty spectacular area, crowded with rilles, mountains and spectacular views and lighting.

I've commented on this before. Here's my first note from the *Hitchhiker's Guide To The Moon*:

"Cassini looks almost comical to me for some reason — the proportions are so odd. But a few moment's contemplation will yield easy views of the two nearly obliterated central peaks that add a poignance, and the odd, fat, short rilles to the east of the encroaching central crater."

Jay Freeman exercised his considerable gift for understatement in describing it as "odd-looking."

The crater is about 57km across. That makes it an easy target, and intrinsically interesting without any

but it is still speculation.

*So remember, when you're feeling very small and insecure,
How amazingly unlikely is your birth,*

The human genome project has found 30,000 genes. It would take only 33 genes to make every living person unique.

And pray that there's intelligent life somewhere up in space,

Hence my membership in Team SETI.

'Cause there's bugger all down here on Earth.

An unassailable truth.

— Paul Kohlmiller, pkohlmil@best.com
[Editor's note: Enjoy more great missives from new editors Paul and Mary Kohlmiller in the coming months.]

gloss from me.

Just a pinch above it you'll find the Alpine Valley. A little southwest: Timocharis.

Good area.

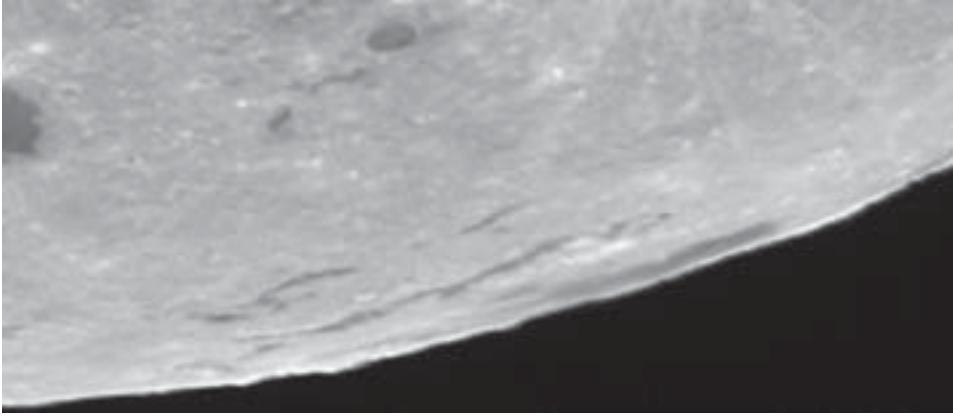
It's named after Giovanni-Domenico (Jack) Cassini who did a bunch of things, including the discovery of four satellites of Saturn and is best known for noting the Cassini Division in Saturn's ring system.

He discovered the polar caps of Mars, and the odd dark area on Iapetus. He worked on the first realistic attempt to derive the distance of the sun, and was off by only about 10 percent. A final highlight of his career was the explanation of the zodiacal light.

He was a clever experimentalist. He made a rough determination of the eccentricities of the earth's orbit by measuring a projection of the sun's image (on a cathedral floor) throughout the year. By comparing the sizes he could calculate proportional distance, and therefore the shape of our orbit.

He was a lousy artist, which should inspire anyone today who thinks

Continued on next page



Bill Arnett snapped this rare view of Mare Orientale on the morning of November 16. The libration in the direction of Orientale was unusually large during third quarter in November.

Mooning

Continued from previous page

about sketching what they see in the sky. You cannot do worse than Cassini.

But that didn't stop him.

Like Messier, his primary interest was comets. Also like Messier, most people don't care about that much at all.

Enough of history.

The logical choice for a probe to Saturn would, of course, be Cassini. And that's how it works out.

Cassini is chugging to Saturn right now after wandering around the solar system to pick up some free gravity-assist momentum.

Experiments are already running, including a test of Einstein's work (no surprise, passed again) and recording the "sound" of a solar storm.

It's expected to arrive next July and four years of doodling around are planned. It will also drop the Huygens probe on Saturn's moon Titan, known to have an atmosphere.

What is learned about Titan and the rings alone will probably pose more questions, and hopefully four years will be enough to get some answers.

Though three space agencies and seventeen nations have been involved in making the Cassini probe real, when push comes to shove it's the Jet Propulsion Laboratory that's sitting in the pilot seat.

JPL, as most of you know, is in the Pasadena area of Los Angeles and tied closely to Caltech, nestled under Mount Wilson where so many things began.

So we have an enigmatic crater named after an important astronomer who inspired the name for Nasa's latest slambang mission — to Saturn.

Why is that in this month's Mooning?

Because on a recent flyby, the Cassini mission scooped up Mojo and Jane Houston Jones, our editors and among the most active contributors to Bay Area amateur astronomy. Arguably the most energetic and inspiring pair of people we've got.

"Cassini looks almost comical to me for some reason — the proportions are so odd ..."

Jane is joining the Cassini Division. And that will put a division of distance between us.

AANC President Jane will be part of the outreach program, and it's hard to imagine someone better suited for the role.

By the time you read this, they will already be down there moving into a new place and getting up to speed.

In spite of the loss to our local groups, this is a good thing for the larger amateur — and professional — community. No, it's terrific!

Besides, we have reasonably strong ties to the Los Angeles Astronomical Society (whose longtime former president has spoken at SJAA and works at JPL) so they're not disappearing into some unknown realm.

Other editors have moved on and the Ephemeris has grown stronger each time. I'm sure that trend will continue, though the bar has been raised with each new editing staff. It's a bit tougher now than when some previous folks took it on (though I doubt anyone will ever equal John Gleason's run...). But I'm sure Paul and Mary Kohlmiller will show us some new tricks.

Mojo and Jane also run sjaa.net out of their now-for-sale house. Not only that, they run websites for the SF Sidewalk Astronomers, the AANC, our own Ephemeris, the San Jose Bridge Club, the Fremont Peak Observatory Association, Litebox Telescopes, East Bay Astro, Jotabout Labs, and the Mount Diablo Astronomical Society. At least. There are also redirects for Bill Arnett's incomparable nineplanets.org, and a sketching website that has played a monster role in promoting amateur artwork of the universe.

All this hardly takes into account the tireless, enthusiastic, friendly and outright wonderful realtime contributions they make at star parties, helping John Dobson with his classes, storing equipment, speaking (and listening with the patience of Job), attending meetings ... their unflagging support for oldtimers and newbies alike.

Aside from being two of the best friends anyone could ever ask for, I will forever be grateful for them taking on the Ephemeris at a time when I did not want (or think it right) to both do that and handle the SJAA presidency at the same time.

Certainly, after seeing the example they've set, I can hardly complain that in my case it was too much work!

So what does this have to do with the Mooning column?

Without them, it wouldn't be here. And this is the last one they'll produce.

Such a passing should not go unsung.

They've done one hell of a job, and deserve a huge thanks from SJAA, all the Bay Area, JPL, NASA and Cassini.

Thank you, MoJane.

— David North, north@znet.com

Perturbations in the Cassini Division

Akkana Peck

As December opens, Mars is still high in the sky in the early evening. It's receding from us as we race away from it in our tighter orbit, and by now has shrunk to 11 arc seconds (down to 9 by month's end), less than half its apparent size at opposition a few months ago. But it's still worth looking at! For one thing, it's not that much smaller than it gets at less favorable oppositions; there are still details there to be seen. For another, it's interesting to see how gibbous it looks now; it's very easy to see the shadow on one side now that Mars is no longer "full."

Jupiter rises a little before midnight; now's the time to get a start on this winter's Jupiter season. Early reports suggest the great red spot has continued its darkening trend — it may be becoming much more visible than it has been in recent years.

In early December evening twilight, Mercury and Venus share the southwestern sky. Venus doesn't set for a couple of hours after sunset, though it remains relatively low in the sky for those two hours. Its phase is still slightly gibbous. Mercury is visible low in the twilight for the first two-thirds of the month, changing in appearance day by day from a small third quarter disc of 5.7 arc seconds to a slim crescent of 9 arc seconds, until it finally becomes too dim to see, and too close to the sun, for the last third of the month. If you have a good western horizon, this is a good time to keep an eye on Mercury — you aren't likely to see any surface details, but the varying phase and size of the innermost planet are one of the most rapidly changing features in our solar system, and it's fun to compare the differences from night to night.

The outer planets, Uranus, Neptune, and Pluto, are all rather close to the sun this month, and won't be easily observable.

Saturn, though, is the showpiece of this December's sky. It rises in early evening and is visible all night. With

the rings wide open, any telescope will show a beautiful view, with the Cassini division easy to see. On better nights you should be able to spot more ring details, some bands of different colors on the planet, and sometimes even transient features like storms. Saturn reaches opposition on December 31st.

Let's talk a bit about Saturn's ring

"With the rings wide open, any telescope will show a beautiful view, with the Cassini division easy to see."

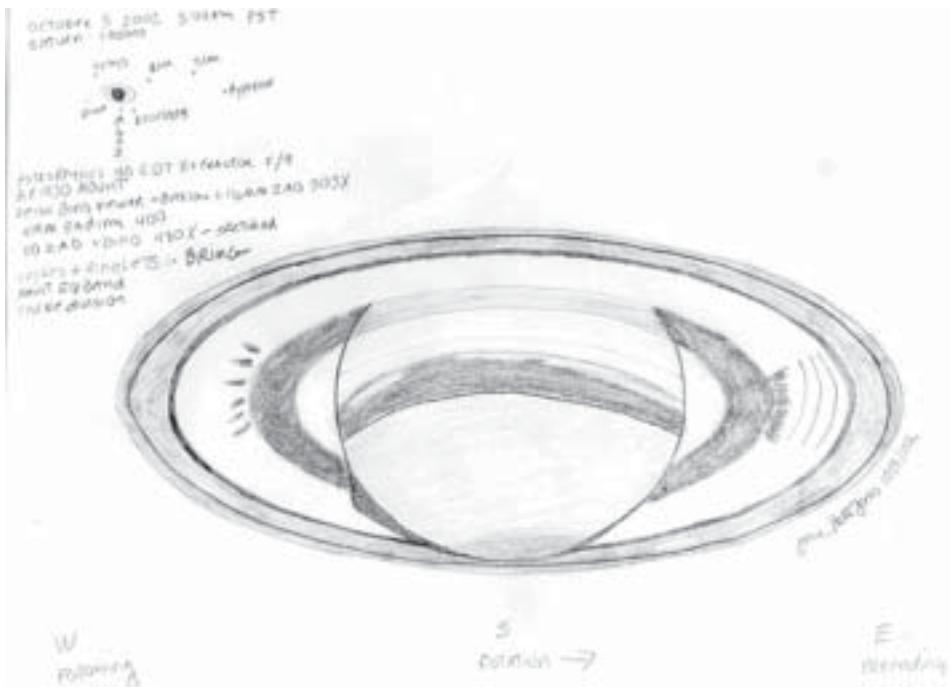
system. You probably already know that the rings aren't one big flat sheet: they're actually composed of many, many small particles, all orbiting Saturn in roughly the same plane. The gaps in the ring are usually caused by the gravitational perturbation of one or more of Saturn's moons. For example, a

particle orbiting Saturn at a distance which gives it a period half that of one of the moons will find that on every other orbit, it gets an extra pull from the moon — and eventually, that extra tug will pull the particle into a different orbit, a little farther from Saturn than it was before. So over a long period of time, moons create zones in the rings which are relatively free of particles: and so we see gaps in Saturn's ring system.

When people talk about Saturn's rings, they usually divide them into three areas: a relatively thin outer ring, the "A" ring; a thicker inner section, the "B" ring; and a wide, but translucent, inner ring called the "C" ring, sometimes called the "Crepe" ring. The Crepe ring is much less bright than the other two; some nights it will be very hard to see even with a large telescope, while on other nights, it's obvious even with a 60mm. Ambient sky brightness and transparency probably have a lot to do with Crepe ring visibility.

The A ring has some gaps inside it; in particular, about 1/4 of the way from the outside of the ring is a subtle gap which has quite a bit of controversy

Continued on next page



Saturn sketched by Jane Houston Jones, October 5, 2002. The planet globe casts a shadow on the rings. The A-ring shows the Encke division, B-ring appears white, and the C-ring a light gray. The C-ring is dark grey, with the globe showing through the crepe ring.

Shallow sky

Continued from previous page

surrounding its name, since it was "discovered" over and over again by various observers over the years; some people call it the Encke division, while others claim that the Encke division is a very thin feature which is almost never visible from amateur telescopes, and that the feature we see is one which was discovered by Keeler, or Kater, or diVico, or perhaps someone else. So no one knows quite what to call it; but nevertheless, there it is, a darkening in the outer part of the A ring, and it's been much easier to see in the last few years with the rings open as wide as they are. So take a look, and don't worry too much about what to call it!

The B ring, as well, has some features visible in an amateur telescope. It's common to see shading in the B ring: for example, it may shade from brighter at the outside edge to dimmer on the inside where it meets the Crepe ring. On nights of really excellent seeing, you may see more than that: there are thin, subtle gaps inside the B ring itself, as well as radial spokes which are sometimes visible to an eagle eyed and practiced observer under perfect conditions.

But what about that big, wide gap between the A and B rings — the one that you can see in even the smallest telescope on nearly any evening? That's the Cassini Division, the most prominent feature in Saturn's ring system — and Jane Houston Jones, longtime Ephemeris co-editor and the observer who drew this month's Saturn sketch, will be working there soon. We've all benefitted from Jane's and Mojo's influence on SJAA's ring system, and we'll all miss them as their orbits dip southward to Pasadena, but I'm sure their perturbations on JPL's system will be equally observable. I know I'll be watching.

Thanks, Jane and Mojo, and good luck!

-- Akkana Peck,
observer@shallowsky.com

'Twas the night before solstice

Jane Houston Jones

Inspired by the poem *A Visit From St. Nicholas*, written by Major Henry Livingston, Jr.

Twas the week before Solstice, when all through the city,
Not a planet was shining, now isn't that a pity.
The telescope was stored in the garage with despair,
In hopes that the weather would soon turn to fair.

The astronomers were nestled all snug in their beds,
While visions of nebulae danced in their heads.
And Mojo with his laptop and I with my starmap,
Had just settled down for a cloudy night nap.

When out on the lawn there arose such a clatter,
I sprang from the bed to see what was the matter.
Away to the window I flew with a flash,
Tore open the shutters and threw up the sash.

The moon shone brightly, no clouds hid the glow,
The full moonlit lustre to objects below.
When what to my wondering eyes should appear,
But Pleiades, Orion, and Ursa Major, the bear.

With our trusty old telescope, the setup was quick,
I knew in a moment we had objects to pick.
More rapid than eagles, the targets they came,
We aimed and we pointed and called them by name.

"Now, Procyon, now Pollux, now Castor and Capella!
On Aldebaran, on Rigel, on Sirius, and Betelgeuse, the red fella :-)
To the top and around the winter circle of stars,
Now a quick look at Saturn, Jupiter, Venus and Mars.

As fireflies that before the dawns morning light,
Brilliantly flicker and soon are a memory bright,
A new wonder would paint the dark sky to pale blue,
The sunrise was nearing and morning twilight was too.

And then in a twinkling, I heard on the roof,
The prancing and pawing of each little hoof.
As I stepped from the telescope and was turning around,
Down the chimney the stranger came with a bound.

He looked like an astronomer, bundled from head to his foot,
Like a stargazer his clothes were tarnished with ashes and soot.
A bundle of toys he had flung on his back,
Looked just like our telescope accessory pack.

His eyes — how they twinkled! his dimples how merry!
His cheeks were like roses, his nose like a cherry
He looked like we do after a cold winter starshow
Freezing but happy from the Milky Way glow

Continued on next page

'Twas the night

Continued from previous page

The stump of a flashlight held tight in his teeth
 Its soft red glow encircled his head like a wreath
 We asked him if he'd ever looked closely at Mars
 "I'm working at night, I have no time for the stars".

He stepped up to the eyepiece, a right jolly old elf,
 And I smiled as he gasped, in spite of myself.
 A wink of his eye and a twist of his head,
 Soon gave me to know I had nothing to dread.

He spoke not a word, but took in view after view,
 Then he spoke with a sigh he had more work to do.
 And laying his finger aside of his nose,
 And giving a nod, up the chimney he rose.

He sprang to his sleigh, to his team gave a whistle,
 And away they all flew like the down of a thistle.
 But I heard him exclaim, ere he drove out of sight,

December Speaker

Dr. Jeffrey Moore speaks on Kuiper belt mission

Come hear Dr. Moore Saturday December 6th 8:00 p.m.

Dr. Jeffrey M. Moore is a research scientist at NASA Ames Research Center. His research has focused on a range of topics relating to the geologic evolution of planetary landscapes and crustal materials. He has conducted extensive laboratory simulations of Martian geologic processes and over the past year has conducted research on the implications of impact craters on Europa for a sub-surface ocean. Dr. Moore is Project Scientist of the Carl Sagan Center, to be located at Ames Research Center. He is imaging node leader for NASA's New Horizons Pluto-

Happy stargazing to all and to all a dark night.

My apologies to Major Henry Livingston Jr. 1748 - 1828, author of *Twas the Night before Christmas* or *Account of a Visit from St. Nicholas*. Previously believed to be the written by Clement Clarke Moore. <http://www.iment.com/maida/familytree/henry/writinghenryjr.htm>
 — Jane Houston Jones, jane@whiteoaks.com

So long, and thanks for all the starfish Morris Jones and Jane Houston Jones

We've been editing the SJAA *Ephemeris* since February 1999. A lot has happened since then. I married the co-editor. Two of our columnists got married too! and now we are passing on the editorial baton to another sorta newly-married couple, Paul and Mary Kohlmiller!

I know you will continue to send Paul and Mary your interesting tales of eclipse chases, astro and other photos and articles you think will interest the readership of the *Ephemeris*. It's been a lot of fun for us. We'll now enjoy reading the *Ephemeris* every month rather than editing it.

Celestial calendar

December 2003

Richard Stanton

Lunar phases:	Date	Rise	Trans	Set
FM	12:27 PST	08	16:43	00:11 07:07
LQ	09:42 PST	16	23:58	06:07 12:35
NM	01:43 PST	23	07:54	12:34 17:16
FQ	02:03 PST	30	12:20	18:37 00:05

Nearer planets:	R. A.	Dec.
Mercury, 0.80 A.U., Mag. +4.8		
07 08:53 13:31 18:09	18:24	-25:33
17 08:36 13:22 18:08	18:54	-23:29
27 07:11 12:07 17:02	18:18	-20:57

Venus, 1.38 A.U., Mag. -3.8		
07 09:20 14:03 18:45	18:55	-24:23
17 09:28 14:17 19:05	19:49	-22:51
27 09:31 14:29 19:27	20:41	-20:11

Mars, 0.98 A.U., Mag. +0.1		
07 12:53 18:48 00:43	23:41	-02:41
17 12:27 18:29 00:32	00:01	-00:08
27 12:01 18:11 00:21	00:23	+02:27

Jupiter, 5.40 A.U., Mag. -2.2		
07 00:02 06:23 12:44	11:16	+05:53
17 23:26 05:46 12:06	11:18	+05:39
27 22:48 05:08 11:28	11:20	+05:32

Saturn, 8.08 A.U., Mag. +0.5		
07 18:41 01:57 09:13	06:50	+22:13
17 17:58 01:14 08:30	06:47	+22:18
27 17:15 00:31 07:48	06:43	+22:22

SOL Star Type G2V Intelligent Life in System ?		
Hours of Darkness		
11:14 07 07:09 12:00 16:51 16:53		-22:33
11:19 17 07:17 12:05 16:53 17:37		-23:20
11:18 27 07:22 12:10 16:59 18:22		-23:20

Astronomical twilight:	Begin	End
JD 2,452,980	07	05:36 18:22
990	17	05:43 18:24
2,453,000	27	05:48 18:30

Sidereal time:

Transit Right Ascension at local midnight		
07 00:00 = 04:55		
17 00:00 = 05:34		
27 00:00 = 06:13		

Darkest Saturday Night: 20 Dec 2003

Sunset	16:52
Twilight	18:26
Moon rise	04:08
Dawn begin	05:45
Hours dark	11:19

Officers and Board of Directors

Pres Mike Koop (408) 446-0310
VP Bob Havner (408) 723-2559
Sec Jim Van Nuland (408) 371-1307
Tres Gary Mitchell (408) 265-2336
Dir Bill O'Shaughnessy (408) 984-3985
Dir David Smith (408) 978-5503
Dir Steve Nelson (650) 968-4733
Dir Dana Crom
Dir Craig & Elena Scull

Ephemeris Staff

Editors Jane Houston Jones & Morris Jones (415) 453-2885
Circulation
 Bob Brauer (408) 292-7695
 Lew Kurtz (408) 739-7106
 Dave North north@znet.com
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>

Publication Statement

SJAA Ephemeris, newsletter of the San Jose Astronomical Association, is published monthly, 12 times a year, January through December.
 San Jose Astronomical Association,
 P.O. Box 28243
 San Jose, CA 95159-8243

Submit

Submit articles for publication in the SJAA Ephemeris. Send articles to the editors via e-mail to ephemeris@sjaa.net. **Deadline, 10th of previous month.**

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
7	12.5" Dobson	Tom Fredrickson
8	14" Dobson	Craig Colvin
10	Star Spectroscope	Keng Teh
16	Solar Scope	Bob Havner
19	6" Newt/P Mount	Daryn Baker
23	6" Newt/P Mount	Wei Cheng
24	60mm Refractor	Al Kestler
26	11" Dobson	John Bunyan
28	13" Dobson	Jim Albers
35	Meade 8" Equatorial	Patrick Lewis
38	Meade 4.5" Digital Newt	Tej Kohli

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
3	4" Quantum S/C	Hsin I. Huang	12/19/03
6	8" Celestron S/C	Richard Savage	1/24/04
11	Orion XT6 Dob	Harshavardhan Kuntur	11/22/03
12	Orion XT8 Dob	Jason Yoon	1/8/04
13	Orion XT6 Dob	Kosha Ganatra	12/1/03
29	C8, Astrophotography	Tajinder Singh	11/22/03
32	6" f/7 Dobson	Sandy Mohan	1/28/04
33	10" Deep Space Explorer	Glen White	12/19/03
34	Dynamax 8" S/C	Yuan-Tung Chin	1/24/04
37	4" Fluorite Refractor	Gary Hansen	1/15/04
39	17" Dobson	Ron Gross	12/3/03
N	6" f/8 Dobson	Luen Lin	12/16/03

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	?
9	C-11 Compustar	Bill Maney	Indefinite
14	8" f/8.5 Dob	E. Clay Buchanan	11/23/03
15	8" Dobson	Mike Koop	Repair
21	10" Dobson	Michael Dajewski	Repair
27	13" Dobson	Steve Houlihan	1/5/04
36	Celestron 8" f/6 Skyhopper	Ion Coman	1/19/04

Waiting list:

13	Orion XT6 Dob	Michael Hewett
39	17" Dobsonian	Frank Williamson
	8" Dob	Vinod Nagarajan
	Any telescope	Mike Van Meter, Al Garcia

San Jose Astronomical Association Membership Form

New **Renewal** (Name only, plus corrections below)

Membership Type:

- Regular — \$15
- Regular with Sky & Telescope — \$48
- Junior (under 18) — \$6
- Junior with Sky & Telescope — \$39

Subscribing to Sky & Telescope magazine through the SJAA saves you \$10 off the regular rate. (S&T will not accept multi-year subscriptions through the club program. Allow 2 months lead time.)

Bring this form to any SJAA Meeting or send (with your check) to

**San Jose Astronomical Association
P.O. Box 28243
San Jose, CA 95159-8243**

Make your check payable to "SJAA"
(not Sky Publishing)

Name: _____

Address: _____

City/ST/Zip: _____

Phone: _____

E-mail address: _____

San Jose Astronomical Association
P.O. Box 28243
San Jose, CA 95159-8243

Nonprofit Organization
U.S. Postage Paid
San Jose, California
Permit No. 5381