



SJAA EPHEMERIS

SJAA Activities Calendar

Jim Van Nuland

(late)January

- 20 Dark sky weekend. Sunset 5:19 p.m., 6% moon sets 7:20 p.m.
26 Houge Park star party. Sunset 5:26 p.m., 64% moon sets 2:32 a.m. Star party hours: 7:00 to 10:00

February

- 3 **General meeting at Houge Park.** Doug Brown exploring Mars. 8 p.m.
9 Houge Park star party. Sunset 5:41 p.m., 52% moon rise 1:11 a.m. Star party hours: 7:00 to 10:00
9 Astronomy Class at Houge Park. Astronomy Class Topic is Binocular Astronomy with Jay Reynolds Freeman 7:30 p.m.
10 Dark sky weekend. Sunset 5:42 p.m., 42% moon rise 2:13 a.m.
17 Dark sky weekend. Sunset 5:50 p.m., <1% moon sets 6:11 p.m.
23 Houge Park star party. Sunset 5:56 p.m., 49% moon sets 1:34 a.m. Star party hours: 7:00 to 10:00

March

- 3 **General meeting at Houge Park.** Our speaker is Dr. James Graham talking about planetary disk observations with the Keck using adaptive optics and Hubble. 8 p.m.
9 Houge Park star party. Sunset 6:09 p.m., 68% moon rise 00:01 a.m. Star party hours: 7:00 to 10:00
10 Dark sky weekend. Sunset 6:10 p.m., 59% moon rise 1:03 a.m.
11 Daylight Saving Time begins. Advance clock one hour.
17 Dark sky weekend. Messier Marathon. Sunset 7:17 p.m., 1% moon rise 7:00 a.m.
23 Astronomy Class at Houge Park. The subject will be the moon. 7:30 p.m.
23 Houge Park star party. Sunset 7:22 p.m., 34% moon sets 1:31 a.m. Star party hours: 8:30 to 11:30

The Board of Directors meets at 6:00 p.m. preceding each general meeting. All are welcome.

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

February General Meeting

Doug Brown on Exploring Mars

Feb. 3 at 8 p.m. @ Houge Park

David Smith

Doug Brown, President of the Fremont Peak Observatory Association, will give us a short update on the programs and status of the FPOA. Then he will present "Exploring Mars", a review of past, present and future Mars exploration, with an emphasis on the current Mars rover missions. This fast-moving presentation contains spectacular visuals and the latest in-depth technical information. His talk has received acclaim from numerous school, community and astronomy associations, but Doug says he prefers a technical audience, such as ours. When not doing astronomy, Doug is an executive with Applied Materials and an avid bush pilot.

Elections!

The Board election is held each year at the February General Meeting.

The following directors have another year to go and are not up for re-election this year:

Gary Mitchell
Dave Smith
Mike Koop
Rob Hawley

The following directors are up for re-election this year and it is not known at this time if they will run again or not:

Rich Neuschaefer
Lee Hoglan
Craig Scull

In addition, one board seat is vacant and should be filled at this election.

Those interested should write to membership@sjaa.net.

DEEP SKY OBSERVING

by Mark Wagner

February 2007 third quarter to new moon observing list. Primary targets are generally easy. Secondary targets range from more difficult to very difficult and are near the primary targets as you star hop. The list begins in the north and moves southward. Objects are within roughly a two hour section of right ascension that is at a comfortable elevation to the east at astronomical dark. This list is just a sampling of the full list which is at <http://www.resource-intl.com/Deep.Sky.Feb.07.html>.

| TARGET | TYPE | SIZE | MAG. | RA | DEC | PRIMARY/ SECONDARY |
|---|------------------|---------------|------|-------------|--------------|-----------------------|
| NGC 2366 | Galaxy | 8.2' x 3.3' | 11.5 | 07h 28m 53s | 69° 12' 44" | Secondary |
| Large, elongated, low surface brightness galaxy with giant HII region at one end. | | | | | | |
| NGC 2403 | Galaxy | 22.1 x 12.4' | 8.9 | 07h 36d 51s | 65° 36' 10" | Primary |
| Low surface brightness, chaotic spiral galaxy, tremendous wealth of detail, two broad diffuse arms, dark lanes, mottling and HII regions. | | | | | | |
| Arp 336 | Galaxy | 4.5' x 2.4' | 11.2 | 08h 55m 35s | 58° 44' 02" | Secondary |
| NGC 2685, spindle shaped galaxy with a redshift discrepancy. | | | | | | |
| Arp 285 | Galaxy | 1.6' x 0.6' | 13.8 | 09h 24m 03s | 49° 12' 14" | Primary |
| Double galaxy - NGC 2854 has S shape, and NGC 2856 - galaxies are infalling. Arp 1 - NGC 2857 nearby. | | | | | | |
| NGC 2419 | Globular Cluster | 4.6' | 10.3 | 07h 38m 08s | 38° 52' 56" | Primary |
| Globular cluster known as the Intergalactic Wanderer, furthest globular from the Sun. | | | | | | |
| NGC 2371/2372 | Planetary Nebula | 55.0" | 13.0 | 07h 25m 34s | 29° 29' 22" | Primary |
| "The Peanut" bilobed planetary nebula with two bright knots. Small, bright, encased by very dim halo. | | | | | | |
| NGC 2392 | Planetary Nebula | 50.0" | 9.9 | 07h 29m 11s | 20° 54' 39" | Primary |
| Eskino Nebula - planetary, very bright. Central star, concentric rings with detail at higher powers. | | | | | | |
| NGC 2395 | Open Cluster | 12.0' | 8.0 | 07h 27m 13s | 13° 36' 30" | Secondary |
| Sparse scattered cluster of about 50 stars, very near Abell 21 | | | | | | |
| M48 | Open Cluster | 54.0' | 5.8 | 08h 13m 44s | -05° 45' 00" | Primary |
| Big and bright, 30+ bright stars in a diffuse OC. Appears to be close to 1/2 deg across. | | | | | | |
| NGC 2525 | Galaxy | 2.9' x 1.9' | 12.3 | 08h 05m 38s | -11° 25' 37" | Secondary |
| This galaxy's dim spiral arms make it appear "crabby" in shape. | | | | | | |
| NGC 2359 | Emission Nebula | 13.0' x 11.0' | | 07h 18m 31s | -13° 14' 00" | Primary |
| Thor's Helmet. With the strand catalogued as 2361, this is a great Wolf-Rayet illuminated nebula region with an OIII filter. | | | | | | |
| M47 | Open Cluster | 29.0' | 4.4 | 07h 36m 36s | -14° 29' 00" | Primary |
| Large rich but coarse open cluster. Interesting contrast to M46. | | | | | | |
| NGC 2438 | Planetary Nebula | 64.0" | 10.1 | 07h 41m 50s | -14° 44' 06" | Primary |
| Annular planetary nebula nw of the center of M46. Believed to be foreground. | | | | | | |
| M46 | Open Cluster | 27.0' | 6.1 | 07h 41m 47s | -14° 48' 36" | Primary |
| Large very rich open cluster with many stars near the same magnitude. | | | | | | |
| NGC 2440 | Planetary Nebula | 70.0" | 10.8 | 07h 41m 55s | -18° 12' 31" | Primary |
| Bipolar planetary with lots of detail at high magnification. | | | | | | |
| M93 | Open Cluster | 22' | 6.2 | 07h 44m 30s | -23° 51' 12" | Primary |
| Large - a degree, visible in finder, wedge shaped. | | | | | | |

About this dwarf planet Pluto

Gary Mitchell

There has been much hand-wringing of late about Pluto being demoted to “dwarf planet.” The Ephemeris carried a couple of articles recently on the subject. One author even suggested grandfathering Pluto in as a planet. Here’s an alternate view.

Pluto is tiny, even smaller than our Moon by about two thirds. That by itself doesn’t necessarily mean Pluto shouldn’t be a planet, but the perspective is interesting.

Try this: Pull out a dime and a dollar coin (Sacagawea). If we let the dollar represent our Moon, then the dime would be about the size of Pluto.

A 150 pound person on Earth would weigh 27 pounds on our Moon, but they’d weigh only 12 pounds on Pluto. Pole vault anyone? ☺

I find the density even more telling. Your typical garden variety rock is roughly 3 g/cm³. Water is 1.00 g/cm³, that’s why rocks sink in water. The Earth’s density is 5.5 g/cm³, we have a core of iron and other heavy elements. Our Moon’s density is 3.34g/cm³ indicating it is made mostly of crust material (rock) and doesn’t have a significant iron core. This, by the way, is strong evidence for the hypothesis that the Moon formed from the debris of a collision between the primordial Earth and a Mars-sized object.

Pluto, on the other hand, is only 1.1g/cm³. This means Pluto is made mostly of frozen liquids and gases. If Pluto were brought in close to the Sun where the Earth is, it would melt and evaporate. It would become a fantastic comet!

Try this: Get a glass of water, stir in a spoon full of dirt, now freeze it. What you have there is not a bad simulated sample of Pluto.

Pluto wasn’t the first to be demoted

Have you heard about poor Ceres? For

51 long years it was a planet, then in 1851 it got demoted to mere asteroid. There were several “planets” discovered by then and counting. As we learned more, it became clear that either we must get used to a solar system with dozens, possibly even hundreds of planets, or we refine our system of planet classification. Based on people’s reaction to Pluto today, I wonder how much of a hue and cry went up about Ceres.

But that absolutely pales in comparison to what happened to the Earth. The Earth was at the center of the whole Universe since the beginning of time! All things revolved around us. Those were glorious and heady times, weren’t they? Then, horror of horrors, around 1543 the powers that be demoted the Earth to a lowly measly planet. We went from THE center to one of many mere planets orbiting the Sun. It’s our own home too, not some tiny ice ball that we barely know way out at the fringes of the solar system. Oh, the ignominy of it all!

How could they do such a thing to poor Earth? Or for that matter, Pluto? Simple, we have this annoying little habit of learning more and more about the nature of things.

The proposal paper

The January 2007 Scientific American has an interesting article about Pluto’s status. They included a link to the original proposal for planetary definition that got this whole ball rolling (“Planet Classification: Gravity Rules”). The paper is available in PDF format at http://www.boulder.swri.edu/~hal/PDF/planet_def.pdf. It gets into some mathematics, but it’s an interesting read if you gloss over the dense parts.

Intrinsic vs Dynamic

There are a couple of approaches to defining a planet. The argument for an intrinsic definition (considering only the qualities of the body by itself) fails to

account for the possibility that the body is a moon. For example: some of the larger moons of Jupiter and Saturn could easily be called planets if they orbited the sun. A dynamic classification takes into account the planet’s orbit and how it affects other bodies.

The definition

So, thanks to the IAU, now we have these three requirements for planethood: (final resolution <http://www.iau.org/iau0602.423.0.html>)

- 1) Orbits the sun.
- 2) Sufficiently massive that gravity dominates its hydrodynamic equilibrium. (Translation: gravity is primarily responsible for it’s shape. This removes the notion of “how round is round.”) But it must not be so massive that fusion can happen or has ever happened in its core. This excludes brown dwarfs.
- 3) It clears its orbit of anything less massive. That is, a planet is the most massive thing in its particular orbit.

OK, about that last one... I (and many others) have a problem with that. Doesn’t this mean there are no planets at all? After all, even Jupiter has other “stuff” floating around in its orbit.

Well, yes, but that’s not a problem. According to the definition paper, they intended for a planet to be *capable* of clearing it’s orbit zone, not necessarily that it actually has. That’s an important distinction, (something the news media often misses).

Have you heard about this? The definition paper talks of “überplanets” and “ünterplanets,” (translation: superplanet and subplanet).

Most people agree that third qualification could use some refining, but basically it defines an überplanet as one whose mass is such that it will win any fight (dominate) against something else in its orbit. That means it will (if

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Continued from page 3

they get close enough) disrupt the orbit of any "opponent" by either flinging it out or in, absorbing it, or forcing some sort of resonance orbit. An unterplanet is one that cannot do that.

And THAT is the killer that demoted Pluto – it is forced into a resonant orbit by Neptune. Further, Pluto shares it's orbit with this wide swath of minor planets and planetesimals called the Kuiper belt. Pluto is one of the largest of the Kuiper belt objects (KBO), but it is not capable of clearing them out. So, there it is.

There are planets and then there are PLANETS

If you have trouble with Pluto being a dwarf planet, you're going to *love* this: According to the planet classification paper, the Earth is a DWARF! The media told us that Pluto is now a dwarf planet and the other eight are planets. Right? As is so often the case with the media, we didn't get the complete story. (We can't blame them too much, however, since the final resolution doesn't go into these details.) The definition paper describes several categories. There are supergiants, giants, subgiants, dwarfs, and subdwarfs. And each of those are subdivided into rocky, icy, and hydrogen.

So, here's what we've got: Jupiter is a hydrogen giant. Saturn is a hydrogen subgiant. Uranus and Neptune are icy subgiants. Most of the KBOs are icy subdwarfs. Mercury, Venus, Earth, Mars, and PSR1257+12C are rocky dwarfs. Pluto, Charon, the largest asteroids, some KBO's, and PSR1257_12A,B are rocky subdwarfs. Even moons are included if you tack on "satellite," Saturn's moon Titan is an icy subdwarf satellite.

I don't understand why they called Pluto rocky and not icy. It also seems to me the first criterion needs a little refinement too. The shape of a blob of water would be dominated by its gravity, but I dare say no one would call that a planet. Of course, a blob of water couldn't dominate its orbit, so at least there's that.

Bottom line

I like to think of it this way: We haven't lost a planet, we've gained a whole bunch of minor planets.

For those who still insist on Pluto being retained as a planet, consider this: Why only Pluto? Why not reinstate Ceres too? After all, Ceres got the shaft before Pluto. Then Ceres would be the fifth planet, between Mars and Jupiter. Not to mention the other large asteroids. And last but not least: Of course, we should also reinstate the Earth to its original glorious status too! Shouldn't we? After all, what's that tiny little far away ice ball have over the Earth anyway?

☺

The Last 31 Days In Astronomy

This column will list the latest news in Astronomy that have occurred in the last month. In this month it means between Dec. 10 and Jan. 10, 2006.

DEC-18-2006 **Spitzer Spies Early Universe** Spitzer is finding large, bright objects about 13 billion light years away which belong to the early universe. These objects predate any star by a few hundred million years and are unlike anything in the contemporary universe. <http://www.jpl.nasa.gov/news/news.cfm?release=2006-150>

DEC-22-2006 **STS-116 Lands** The space shuttle Discovery landed at KSC after completing an ambitious building project that included an additional spacewalk and rewired the space station's electrical power system. It was also the first nighttime shuttle launch since before the Columbia disaster. http://www.nasa.gov/mission_pages/shuttle/main/index.html

JAN-04-2007 **Service Pack for Rovers** Software update for Rovers Spirit and Opportunity on Mars. One update enables rovers to recognize dust devils and clouds. Another gives a skill called "visual target tracking" which allows them to "go and touch." The software will help them avoid hazards and navigational deadends. <http://www.astronomy.com/asy/default.aspx?c=a&id=4975>

JAN-03-2007 **Liquid Lakes on Titan** NASA scientists say they now have proof that at least some of the surface features that look like liquid lakes on Titan are just exactly that. The results are in an article in the journal Nature. <http://www.jpl.nasa.gov/news/features.cfm?feature=1258>

JAN-07-2007 **3D Map of Dark Matter** An international team of astronomers using the HST have created the first three-dimensional map of dark matter in the universe. The map gives the best evidence to date that normal matter (e.g. galaxies) formed along filaments of dark matter. http://www.nasa.gov/home/hqnews/2007/jan/HQ_07002_Hubble_Dark_Matter.html

JAN-09-2007 **Space Pillars Doomed** Images from the Spitzer Space Telescope indicate that a supernova in the Eagle Nebula has probably destroyed the Pillars of Creation. The Pillars photo was taken by Dr. Jeff Hester's team and is one of the most famous pictures ever taken by the Hubble telescope. But Spitzer, working in the infrared, shows a large shock wave that by now should have created havoc in that area. <http://www.jpl.nasa.gov/news/news.cfm?release=2007-003>

JAN-10-2007 **Triple Quasar Found** Since the 1980's, astronomers have found that quasars occasionally show up in pairs. Now they have found a triple quasar. At first, it seemed likely that the third quasar was actually a result of gravitational lensing but subsequent observations appear to rule that out. <http://skytonight.com/news/home/5141272.html>

Space Weather for Air Travelers

Tony Phillips

At a time when much of the airline industry is struggling, one type of air travel is doing remarkably well: polar flights. In 1999, United Airlines made just twelve trips over the Arctic. By 2005, the number of flights had grown to 1,402. Other airlines report similar growth.

The reason for the increase is commerce. Business is booming along Asia's Pacific Rim, and business travel is booming with it. On our spherical Earth, the shortest distance from Chicago to Beijing or New York to Tokyo is over the North Pole. Suddenly, business travelers are spending a lot of time in the Arctic.

With these new routes, however, comes a new concern: space weather.

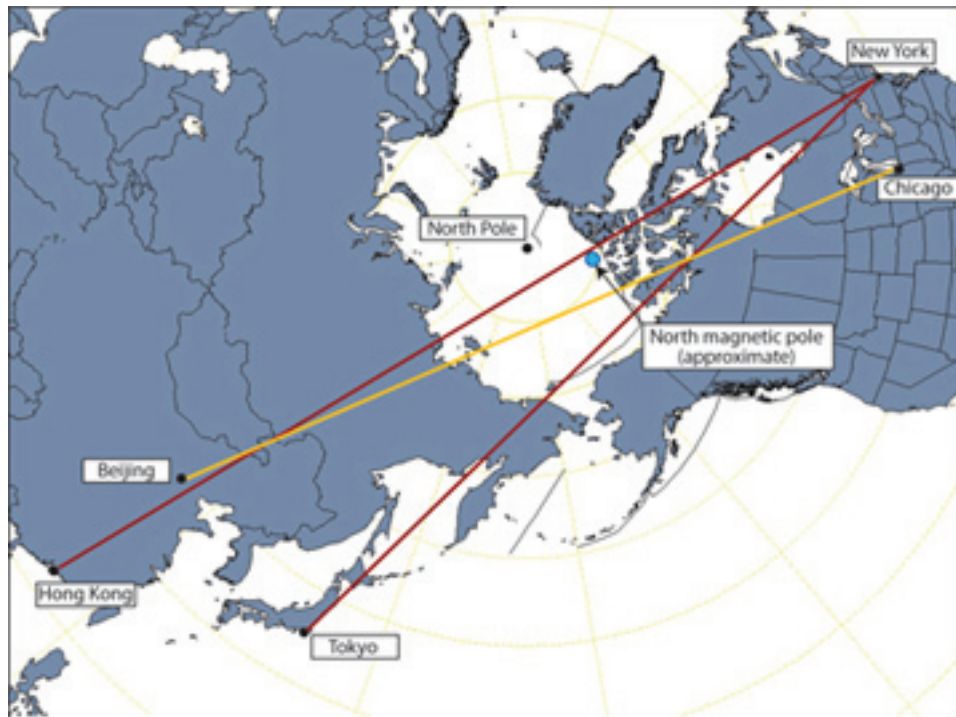
"Solar storms have a big effect on polar regions of our planet," explains Steve Hill of NOAA's Space Weather Prediction Center in Boulder, Colorado. Everyone knows about the Northern Lights, but there's more to it than that: "When airplanes fly over the poles during solar storms, they can experience radio blackouts, navigation errors and computer reboots—all caused by space radiation."

In 2005, United Airlines reported dozens of flights diverted from polar routes by nasty space weather. Delays ranged from 8 minutes to nearly 4 hours, and each unplanned detour burned expensive

fuel. Money isn't the only concern: Pilots and flight attendants who fly too often over the poles could absorb more radiation than is healthy. "This is an area of active research—figuring out how much exposure is safe for flight crews," says Hill. "Clearly, less is better."

To help airlines avoid bad space weather, NOAA has begun equipping its GOES weather satellites with improved instruments to monitor the Sun. Recent additions to the fleet, GOES

"Our next-generation satellite will be even better," says Hill. Slated for launch in 2014, GOES-R will be able to photograph the Sun through several different X-ray and ultra-violet filters. Each filter reveals a somewhat different layer of the Sun's explosive atmosphere—a boon to forecasters. Also, advanced sensors will alert ground controllers to a variety of dangerous particles near Earth, including solar protons, heavy ions and galactic cosmic rays.



The shortest airline routes from the Eastern U.S. to popular destinations in Asia go very near the magnetic North Pole, where space weather is of greatest concern.

12 and 13, carry X-ray telescopes that take spectacular pictures of sunspots, solar flares, and coronal holes spewing streams of solar wind in our direction. Other GOES sensors detect solar protons swarming around our planet, raising alarms when radiation levels become dangerous.

"GOES-R should substantially improve our space weather forecasts," says Hill. That means friendlier skies on your future trips to Tokyo.

For the latest space weather report, visit the website of the Space Weather Prediction Center at <http://www.sec.noaa.gov/>. For more about the GOES-R

series spacecraft, see http://goespoes.gsfc.nasa.gov/goes/spacecraft/r_spacecraft.html. For help in explaining geostationary orbits to kids—or anyone else—visit The Space Place at http://spaceplace.nasa.gov/en/kids/goes/goes_poes_orbits.shtml.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

Solar System Stats for February 2007

Adapted from the Observer's Handbook published by The Royal Astronomical Society of Canada which in turn gets this data from the U.S. Naval Observatory's Nautical Almanac Office and Her Majesty's Nautical Almanac Office and contributions by David Lane, St. Mary's University, Halifax NS.

| | | Mercury | Venus | Mars | Jupiter | Saturn | Uranus | Neptune | Sun |
|------|----|---------------------------------|---------------------------------|---------------------------------|---------------------------------|--------------------------------|---------------------------------|---------------------------------|---------------------------------|
| RA | 1 | 22 ^h 01 ^m | 22 ^h 28 ^m | 18 ^h 48 ^m | 16 ^h 51 ^m | 9 ^h 40 ^m | 22 ^h 58 ^m | 21 ^h 26 ^m | 20 ^h 56 ^m |
| | 11 | 22 ^h 41 ^m | 23 ^h 15 ^m | 19 ^h 21 ^m | 16 ^h 57 ^m | 9 ^h 37 ^m | 23 ^h 00 ^m | 21 ^h 28 ^m | 21 ^h 37 ^m |
| | 21 | 22 ^h 27 ^m | 23 ^h 59 ^m | 19 ^h 53 ^m | 17 ^h 03 ^m | 9 ^h 34 ^m | 23 ^h 02 ^m | 21 ^h 29 ^m | 22 ^h 15 ^m |
| Dec | 1 | -13°02' | -11°12' | -23°37' | -21°47' | 15°17' | -7°27' | -15°18' | -17°18' |
| | 11 | -6°44' | -6°19' | -22°54' | -21°57' | 15°34' | -7°14' | -15°11' | -14°15' |
| | 21 | -5°48' | -1°10' | -21°47' | -22°05' | 15°50' | -7°02' | -15°04' | -10°48' |
| Dist | 1 | 1.13 | 1.52 | 2.24 | 5.82 | 8.22 | 20.92 | 31.03 | 0.985 |
| | 11 | 0.86 | 1.48 | 2.18 | 5.67 | 8.20 | 21.00 | 31.04 | 0.987 |
| | 21 | 0.66 | 1.44 | 2.13 | 5.52 | 8.22 | 21.05 | 31.02 | 0.989 |
| Mag | 1 | -0.9 | -3.8 | 1.4 | -1.9 | 0.0 | 5.9 | 8.0 | |
| | 11 | -0.1 | -3.8 | 1.3 | -1.9 | 0.0 | 5.9 | 8.0 | |
| | 21 | 4.4 | -3.8 | 1.3 | -2.0 | 0.0 | 5.9 | 8.0 | |
| Size | 1 | 5.9'' | 11.0'' | 4.2'' | 33.9'' | 20.2'' | 3.3'' | 2.2'' | 32'28'' |
| | 11 | 7.8'' | 11.3'' | 4.3'' | 34.7'' | 20.3'' | 3.3'' | 2.2'' | 32'25'' |
| | 21 | 10.2'' | 11.6'' | 4.4'' | 35.7'' | 20.2'' | 3.3'' | 2.2'' | 32'21'' |

The Shallow Sky

Planets on the Horizon

Akkana Peck

Saturn continues to be the main planetary show through February. The ringed planet reaches opposition on February 10, climbing to 68 degrees above the horizon when it transits around midnight. The rings are tilted just short of fourteen degrees, with the southern side pointed our way.

Earlier in the evening, Venus gleams in the twilight throughout the month. As February opens, Mercury sits nearby, but it wanes to invisibility by mid-month. This is a good chance to chase the elusive crescent Mercury if you have access to a good western horizon: it's easy to spot the planet during the first week of the month, then once you've found it, follow it each night and watch how fast it grows, wanes in phase, and moves lower and closer to the sun. You'll

be surprised at how much change you see in only a day!

A dedicated planet hunter might be able to catch Uranus as well, more or less midway between Mercury and Venus in the evening sky. The dim sixth magnitude planet won't be easy to spot in the twilight -- is it possible to see it at all, with Mercury and Venus as a guide? It's all the more challenging because it's in Aquarius with no particularly bright stars nearby, but it sounds like an interesting challenge! Meanwhile, Neptune is out of the running, too close to the sun to be visible this month.

Jupiter and Mars are both morning objects this month, with Mars visible only near dawn. Jupiter rises several hours after midnight, but never gets very high in the sky before daylight hides it.

Faint Pluto, too, is in the dawn sky, a very difficult target for anyone but the most determined Plutocrat. You'll have a much easier time in a few months.

But there's another way to view at least one of those morning planets: the Pluto-bound New Horizons spacecraft will have a close encounter with Jupiter at the end of February, with closest approach on the 28th. It last photographed Jupiter in September, from quite a distance, but starting in late January we should start seeing some nice photos of Jupiter "up close and personal" as the spacecraft dives in to the giant planet in order to get some gravity assist on the way out to Pluto.



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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. **Deadline, 10th of previous month.**

SJAA Donations are Tax-Deductible

Rob Hawley

Some reminders now that tax season is upon us. SJAA is a 501(c)(3) charity. If you itemize then any donations to SJAA are deductible from your income taxes. This includes the \$20 SJAA annual dues.

Also the auction is coming up in April. If you have stuff that is sitting around in your garage then this is an opportunity to convert that into deductions as well. Items donated to SJAA for sale are deductible to the full fair market value regardless how much the item sells for. You can also arraign for a portion of the sale to be a donation if you are not comfortable donating the entire sale proceeds. Please contact Rob Hawley at membership@sjaa.net for more information.

Please consult your tax advisor.

SJAA loaner scope status

All scopes are available to any SJAA member; contact Mike Koop by email (koopm@best.com) or by phone at work (408) 473-6315 or home (408) 446-0310 (Please leave message, phone screened).

Available scopes

More than 20 scopes are available and not on loan to anyone. See the list at <http://ephemeris.sjaa.net/0701/EphJan07.pdf> 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 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 |
|---------|---------------------------------|------------------|----------|
| 7 | 12.5" f/7 Dobson | Craig Scull | 1/19/07 |
| 10 | Star Spectroscope | Greg Bradburn | 12/15/06 |
| 12 | 8" f/6 Orion XT Dob | John Schulein | 3/7/07 |
| 29 | 8" Celeston S/C Astrophoto | Rodney Moorehead | 11/18/06 |
| 37 | 4" Celestron Fluorite Refractor | David Smith | 2/4/07 |

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 | ? |
| 8 | 14" f/5 Truss Dobson | Charles Santori | 1/2/07 |
| 9 | C-11 f/10 Compustar | Bill Maney | Indefinite |
| 16 | 60mm H-Alpha Solar Scope | Mike Koop | Repair |
| 21 | 10" Dobson | Michael Dajewski | Repair |
| 33 | 10" Deep Space Explorer | Art Kalb | 12/30/06 |
| 36 | Celestron 8" f/6 Skyhopper | Kristi Whitfield | 12/16/06 |
| 40 | Super C8+ | Srinath Krishnan | 1/15/07 |
| 41 | 18" Sky Designs Dob | Kevin Roberts | 12/17/06 |

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San Jose Astronomical Association Membership Form

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

New **Renewal** (Name only if no corrections)

I'll get the Ephemeris newsletter online

<http://ephemeris.sjaa.net> Questions?

Send e-mail to membership@sjaa.net

Membership Type:

- Regular — \$20
 Regular with Sky & Telescope — \$53
 Junior (under 18) — \$10
 Junior with Sky & Telescope — \$43

Bring this form to any SJAA Meeting
or send to the club address (above).

Please make checks payable to "SJAA".

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.)

You can join or renew online:

<http://www.sjaa.net/SJAAmembership.html>

Name: _____

Address: _____

City/ST/Zip: _____

Phone: _____

E-mail address: _____