



SJAA EPHEMERIS

The Shallow Sky

Moons and More Moons

Akkana Peck

At the SJAA astronomy class last month, I glibly commented that Saturn has the most moons of any planet in the solar system.

Turns out I was wrong: Jupiter has pulled way ahead in the moon race. According to a web site run by Scott Sheppard of the University of Hawaii, the latest satellites tally shows:

Jupiter	63
Saturn	46
Uranus	27
Neptune	13

Not all of these are named. The IAU, at their conference in July of 2004, lists 101 known planetary satellites in the solar system, down to 1 km in diameter, and comments dryly, "At some time in the future it may be advisable to stop naming very small satellites." On the US Geological Survey's planetary nomenclature page (the USGS is apparently running a lot of the IAU's nomenclature programs these days) I count 48 named satellites of Jupiter, 34 for Saturn, 21 for Uranus and 8 for Neptune, a total of 111, so it may be that the IAU's web site is out of date.

And what about Earth? How many moons does it have?

Well, all of the web sites just mentioned list only one. But if you're a fan of the popular web site Astronomy Picture of the Day, you may have seen the April 30th entry, a beautiful astronaut photo from 1998 entitled "The Moons of

Earth". It shows the Earth, our moon (looking quite small and distant) and, in the foreground, the Russian space station Mir.

What a tease! Mir and its successor the International Space Station don't count as moons, of course. They're fun to observe, and you can sometimes see a little detail in the ISS if you follow it smoothly with a good Dobsonian; but they're artificial satellites, not natural ones.

But every now and then, intriguing news items show up about "Earth's second moon", a little five kilometer rock called Cruithne (pronounced "croo-eeen-ya"). Asteroid 3753 Cruithne has a peculiar orbit which takes it both inside and outside the earth's orbit. Over a period of 770 years, if you take snapshots at just the right times, Cruithne traces a horseshoe shape around the earth as the earth orbits the sun.

This isn't, you have to admit, much like a normal moon, and calling Cruithne "Earth's second moon" seems like an unrealistic stretch. Still, Cruithne is an interesting object. It only makes a close approach with the Earth every 385 years: the next approach happens in 2285, at about magnitude 15.5, so it'll be a while before we get to observe Cruithne ourselves. Three other asteroids have been discovered with orbits resonant with the earth's; and Saturn has two moons, Janus and Epimetheus, which follow horseshoe orbits.

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SJAA Activities Calendar

- June** Jim Van Nuland
- 4** Dark sky weekend. Sunset 8:25 p.m., 2% moon rise 4:40 a.m. DST
 - 10** Houge Park star party. Sunset 8:28 p.m., 16% moon sets 11:54 p.m. Star party hours: 9:30 p.m. to midnight.
 - 11** ATM Class at Houge Park. 7:30 p.m.
 - 11** Coyote Lake Park star party. Sunset 8:28 p.m., 23% moon sets 12:29 a.m. Start at 9:30.
 - 18** **General meeting** at Houge Park. 8 p.m. Dorothy Schaumber from the Lick Observatory. History of Lick and its colorful cast.
 - 23** ATM Class at Houge Park. 7:30 p.m.
- July**
- 1** Houge Park star party. Sunset 8:32 p.m., 16% moon rise 2:41 a.m. Star party hours: 9:30 to midnight
 - 1** Astronomy Class
 - 2** Public star party at Coyote Lake Park. Sunset 8:32 p.m., 9% moon rise 3:17 a.m. Starts at 9:30
 - 9** Dark sky weekend. Sunset 8:30 p.m., 12% moon sets 10:52 p.m.
 - 9** FPOA Star-B-Que.
 - 15** Houge Park star party. Sunset 8:28 p.m., 66% moon sets 1:17 a.m. Star party hours: 9:30 to midnight
 - 16** ATM class at Houge Park. 7:30 p.m.
 - 23** **General meeting** at Houge Park. 8 p.m.
 - 28** ATM class at Houge Park. 7:30 p.m.
 - 29** Astronomy Class
 - 29** Houge Park star party. Sunset 8:18 p.m., 28% moon rise 1:17 a.m. Star party hours: 9:00 to midnight
 - 30** Public star party at Coyote Lake Park. Sunset 8:19 p.m., 19% moon rise 1:57 a.m. Starts at 9:00

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

<http://www.sjaa.net>

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But moving along to objects with more normal orbits:

In June, Jupiter, with all 63 of its moons, moves into prime time. Two months past opposition, it's already high enough to observe at nightfall and remains well placed throughout the evening observing hours, though unfortunately it's so far south this summer that it never gets terribly high in the sky. You won't be able to see all those moons, but the brightest four: Io, Europa, Ganymede, and Callisto; make an ever-changing show that's always fun to watch.

This is a good month for double shadow transits, too, starting with a nice transit of Io, Europa, and their shadows, on June 2. Europa has already started its transit by dark, Io comes in at about 7:20, closely followed by Europa's shadow, and Io's shadow joins the party at about 8:30 pm.

An even better early-evening double transit happens on the 9th. Europa begins a transit at around 7:40, with Io joining in a little after 9:00. Then at about 10:10 the fun starts: Io's and Europa's shadows both appear nearly on top of each other. Can you see them as two distinct shadows? Can you see a size difference? Can you tell which shadow is which? As the shadows move across the disk of Jupiter, exiting a bit

Mooning

It's both better and worse than I thought!

This tale wanders around a little, so bear with me. It visits some interesting places.

Not long after the last issue hit the stands, I got an email from our own redoubtable Bob Garfinkle (author of Starhopping and other good stuff) who knows about as much about the lunar nomenclature as anyone, or more. He took me to task for saying

after 1 am, you'll be able to tell them apart by the different speeds at which they cross the disk, as Io's shadow overtakes Europa's and exits first. I haven't seen a transit like this myself; I'm looking forward to it!

Saturn can still be glimpsed, low in the evening twilight, but as June advances it gradually becomes lost in the sun's glare. Goodbye, Saturn – catch you next time around! Meanwhile, we'll have to content ourselves with more Cassini pictures.

Mercury emerges into the evening sky in the latter half of June, so this is a good time to catch it. It also has a conjunction with Saturn on June 26, on the following day, it makes an extremely close daytime approach to Venus, only .06 degrees of separation at 9am. Early risers that morning can still catch a lovely pair, faint Mercury and bright Venus; the more ambitious might want to keep tracking the inner planets as they rise, in order to see the closest pairing of these two planets since 1990. Daytime observation of planets works best if you set up in the shade. That way, you don't have to be so paranoid about accidentally pointing your telescope at the sun. Plan ahead and find a place that will still be in the shade when the close pairing happens, and don't forget to check that the telescope's objective will be shaded, not just the chair where you'll be sitting.

Nit Pickering

Dave North

William Pickering had been wiped off the Moon – his information indicated that was not the case.

What?

First, there ain't no crater named for Bill Pickering in Rukl. Though there is a Pickering, it's named for Edward Pickering, a very different person.

Second, there are plenty of references that indicate he got eradicated, including this gem from Jeff Medkeff

Pluto is at opposition on June 14, so this month begins a good time to look for it. Use a good chart – the one in the RASC Observer's Handbook is reliable, and some of the better star charting programs also give fairly good Pluto maps, though if you compare them you may be surprised at how much difference there is between any two Pluto charts. Pluto's orbit is surprisingly complicated (it's highly elliptical, and in addition, little Pluto is subject to perturbation by other objects) so it's much harder to calculate than the orbits of the inner planets, and since it's so faint, you need very accurate positions of faint stars in order to plot the correct star field to compare against Pluto. But that's part of the fun! To detect Pluto for sure, you have to observe it on several different nights, and notice whether the object you thought was Pluto has moved to a different place. If it moves, it's Pluto (or else you've discovered a new comet or asteroid and should contact the Minor Planet Center right away). So get yourself a chart, or several if you can, get yourself to a darksky with a sizeable scope (12" will do, 10" or less if you're really eagle eyed) and a little sketch pad, and take a look!

Mars is still in the morning sky, but it moves a bit farther from the sun this month, and early risers can probably catch it in the early dawn before the sunrise washes it out.

that tells succinctly why I referred to him as a "goof" last month:

"Messier A was formerly named after ... the crackpot William Henry Pickering. This Pickering was a prolific source of imaginary observations and false scientific claims from the late 1800's through the end of his career; he published extensively on the vegetation patterns that only he could see on the moon, on the weather patterns and

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climate of the moon, and on many other remarkable subjects. He was also involved in malfeasance at Harvard University. He also claimed to be the discoverer of Pluto. (This list could go on and on.) Practically the only credible observation he made was the discovery of Phoebe. (However, he claimed to have discovered several satellites of Saturn that turn out not to exist!)

"The currently named crater Pickering (at about 2S, 7E) is named after Edward Charles Pickering, Director of Harvard Observatory etc.

"William Henry was Edward Charles' younger brother." A quick word about Ed: though he was a careful and rational scientist, probably the smartest thing he ever did was hire some cheap help to speed up his work analyzing bucketloads of stars. Cheap? Well, yeah. Women to be exact.

Among them was Annie Jump Cannon.

Oh, that was Ed Pickering! Yup. And in a weird kind of justice, most people will recognize Annie Cannon, but forget who got her into the business. Fair enough.

But let's get back to his shiftless brother.

First, for better or worse, the arbitration of names on the Moon (and lots of other places) is determined by the International Astronomical Union, often at incredibly boring meetings around the world. At one such in Hamburg in 1964 they dropped W. Pickering and renamed it Messier A. This is half of the fascinating double crater that, if you haven't seen it, you certainly should. Messier is the perfect name for it!

So far, so good.

But a close look will show us that somewhere in there, E. Pickering became just plain old Pickering. Hmm.

On top of that, Bob referred me to a United States Geological Survey web

page, <http://planetarynames.wr.usgs.gov/> that indicates that the current crater Pickering (remember, not the same as the current Messier A) is named for both Ed and Bill Pickering! What?

So okay, USGS thinks that, but who are they? Not that I could get anything out of the IAU website – it's a pathetic nothing you could have slapped together in ten minutes. However, if you fish around for a while, it refers back to USGS.

What's up with that?

So I opine to Bob that USGS is a neat organization and everything, but doesn't IAU determine these things?

Turns out that's both yes and no. IAU has done a really lousy job of maintaining nomenclature for many years, but finally gave up and just dropped the whole thing on USGS. So now, though IAU is officially the arbitrator, the people who actually publish the results (as best they can be determined) is the Flagstaff office of the Geological Survey!

Talk about nepotism – Pickering had a tight association there in the days of Lowell (another creative observer).

So, if you want to stop there, that's the final word and I print a retraction. But what's the fun in that? Off we go to the USGS website.

Digging a little deeper we run into a problem. The reference for the (current) Moon crater Pickering is identical to the reference to the Mars crater Pickering (both named for both Pickering's). But even weirder, the date listed for the naming is 1935.

This is patently impossible, since it was clearly Ed Pickering's crater until the 1960s. Heck, I have IAU listings that show that!

Not only is the information wrong, it's pretty clear that some cut'n'paste has been going on.

So I ask Bob about that, and it turns out that the database currently published by USGS is chock full o' errors and inconsistencies. Part of that is due to shoddy work on the part of the IAU before USGS got to it, and now all kinds of people (including Bob) are working to straighten out the mess.

But it is far from straight.

Being an American in the older sense of the word, I don't tend to think something is right just because a bunch of bureaucrats say so, especially when they are obviously wrong in at least part of what they're saying.

So part of the listing is clearly bogus, and on that basis I've decided the entire Pickering reference is suspect.

But I'm going even further than that! If in fact the database is in a state of flux due to accuracy problems (and it sure looks that way to me) I cannot see any reason to consider it to be a final authority – yet.

In fact, I propose that we're in a period where, logically, there is no final authority.

Don't get me wrong here. It may turn out that Bob is right and the IAU did at one time somehow determine that the crater Pickering is named for both of them. In a horse race like this, I'd bet on Bob.

Nevertheless, they've got a bit of work to do to convince me. And even better, as far as I'm concerned changing "Bacon" to "Baco" (as in "Bits") is probably just another blunder, and I shall henceforth refer to "Bacon" without further kowtowing. Bring back the Serpentine Ridge! Down the drain with Dorsa Smirnov.

Take that, IAU!

And let's hope for both clarity and some esthetic sense from USGS.

Generally, they've done pretty well.

Auction Success

Michael Koop

On April 24, 2005, the SJAA 25th Annual Auction was one to remember. After a delay due to the late arrival of some auction material, Auctioneer Jay Freeman started off with the largest scope there, a C14 on a G11 mount. The minimum bid was set at \$100! I was the high bidder for about 3 seconds, but the bidding went quickly beyond \$500, onto \$1000, \$2000, \$2500, before settling at \$3000. First time auction attendee Benjamin Mendelsohn had won the first item and was shaking with excitement wondering if he could afford the rest of the afternoon! Sam Sweiss of Scope City attended along with his wife Maria. Sam had brought 4 used scopes priced to go at about half of what he was asking at the store. As the bidding went on, Sam kept adding additional accessories increasing the value of the package greater than the bid increase! What fun! Another bargain was the new Parks Wave Binoculars and the Parks Pioneer spotting scopes at 1/2

off the suggested retail price.

Sam was also an active buyer getting into a bidding war with James Turley over the Sky Image Lab prints. Sam eventually won all three prints!

The afternoon was filled with laughter and remembrances of past equipment owned. We saw a little bit of everything at the auction: A beautiful print of the Hubble shot of M51, an O III Filter, a set of planetary filters, a new Parks Gold Series Eyepiece, tickets to Lick's summer program, books, and videos. There were a few antique items for sale including 1902 copy of John Herschel's "Outlines of Astronomy" along with copies of Bonestell's "Across the Space Frontier". Even Auctioneer Freeman picked up a classic Brandon 16mm Eyepiece. 102 unique items were auctioned off for a net of \$7930.30 which earned the club \$1249.25. An additional \$150.25 was raised at the swap after the auction. Joe

Sunseri of Earth and Sky Adventure Products was there with many accessories for those people who did not find what they were looking for at the auction.

Thanks to the overworked auction staff: Bid runners Rob Hawley and Bob Havner, Book keeper Jim Van Nuland, Treasurer Gary Mitchell, and Jim Albers for manning the soda sales. Additional thanks to those who donated material including Sky Image Lab, The Medlocks, Lick Observatory, and Chabot Space and Science Center. Special thanks to Sam Sweiss for the generous donation on behalf of Scope City, Parks Optical, and Lumicon International, whose participation is to help promote astronomy to the public. As EAS president Carter Roberts stated about the auction; "You need to bill it as entertainment. I had forgotten how much fun it is!"

Seeing a Solar Eclipse

Not Necessarily a Once in a Lifetime Experience

David Findley

Back in Virginia in the early seventies (note: probably March 7, 1970), I witnessed an almost total eclipse of the sun. It did not occur to me at the time to drive an hour or so to a region of totality. Later, as I began to read about the phenomena that could occur during totality, I became wistful about having missed the experience. I read that the next total solar eclipse in the US would occur in 2017, which seemed like a very long time away at that time. Even if I were still on this side of the grass in that year, I could not depend on the integrity of my vision and other faculties to fully appreciate the event. I decided that a total solar eclipse would just be one of those experiences in life that I would not enjoy. In recent years,

however, with my awakening interest in astronomy, I began to notice advertisements for "eclipse tours." The light bulb was illuminated: I did not need to wait for an eclipse to come to me; I could go to the eclipse! Reading about an upcoming hybrid solar eclipse (total in mid-Pacific and annular elsewhere), I did a web search for eclipse tours. The cruise ship leaving from Tahiti seemed a bit extravagant for a novice eclipse viewer, but the tour offered by "Ring of Fire Expeditions" (ROFE) to Panama was appealing. It was reasonable in cost, and the idea of a short tour of Panama, staying in a coastal resort, along with the opportunity to experience an almost total annular eclipse was irresistible. I

sent in the deposit for my wife and me. ROFE is loosely affiliated with the NASA Johnson Space Center Astronomical Society and uses a Houston travel agency to handle air-ground arrangements.

Paul Maley, who works in the flight director's office at Johnson, has organized several of these tours over the past years. He visits a site a year or so in advance of the event, checking weather records, lodging and transportation arrangements. He tries to coordinate the event with a local astronomy group, if possible. He makes an effort to insure that the event is comfortable and interesting to non-astronomically

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oriented companions as well as for the astronomers. He arranges a co-leader or two for large groups. In the months and weeks leading up to the Panama eclipse, Paul sent out notes about the event and the venue. There is eclipse etiquette just like there is star party etiquette, and Paul made sure that we were informed. There was not much in the way of advice about equipment to bring; in fact, he advised first-timers just to show up and see what the others do. His general advice was to have a plan for observing made out in advance and to try out the plan well before the actual event. Initially I ordered Coronado Binomite solar binoculars, but when they failed to ship in a timely manner, I cancelled the order and purchased Orion solar filters and a tripod adapter for my binoculars from the local Orion store. The tripod made viewing much less tiring over the time from first contact to annularity than it would have been otherwise, and made it easy to share the view with my wife and others. Viewing through binoculars turned out to be much more satisfying than relying on eclipse eyeglasses.

On Wednesday, April 6, most of the group assembled at George Bush Airport in Houston for the four hour flight to Panama City. I noticed that several of the participants packed their observing gear as carry-on luggage rather than entrusting it to the cargo hold. We arrived about 7 PM, and after the usual immigration lines and baggage hassles, the group boarded two motor coaches for the 90 minute drive to the Royal Decameron Resort on the Pacific coast west of

Panama City. It is a common misconception that Panama runs north to south; actually, it runs west to east, so the Pacific coast faces south. The tour guide on the bus, who would be with us throughout our stay, described the sights as we drove from the airport, through the city, across the Canal passage and into the countryside.

As we gathered in the lobby I began to realize what a world of eclipse groupies I had joined. Someone came up to me and asked, "are you Ernie?" "No," I answered, do I look like Ernie?" "Actually, I haven't seen Ernie since 1984 in Madagascar (or some such location), so I don't really know what he looks like now," was his reply. We had seventy people in our group. Probably the majority were from Texas, but there were participants in the group from California (two from San Jose), Washington, other states, a couple from Mexico, a student from the Czech

"... we could hear the birds begin their evening routine and the tree frogs start their evening calls, two or three hours before normal. ... I was ecstatic to be there ..."

Republic and one from England. A few were non-astronomically involved spouses, children, grandkids or first-timers like my wife and I, but most were hard core eclipse chasers. If there is an eclipse they want to be there, and they make the effort to be on the path. They constantly sprinkled their

conversations with references to past eclipses at exotic locales such as Africa, Iceland or Mongolia.

On Thursday, the whole group boarded two motor coaches for a tour of the

historical sights of Panama City. The highlight of the tour was a visit to the Miraflores locks on the Pacific exit of the Canal. There we were entranced by the sight of small electric locomotives, called "mules," pulling giant cargo ships into the lock, where they would be lowered about twenty feet in a half-hour or so,

and then discharged into the Pacific. I was getting concerned about the weather since it was

overcast, and we had a noon downpour. We heard that the dry season ended two weeks earlier than usual, perhaps due to El Nino. What did this portend for the day of the eclipse?

Back at the resort we enjoyed lavish buffet breakfasts, lunches, snacks, and dinners in a variety of specialty restaurants. Unlimited alcoholic beverages, and even cigarettes, were available, all included in the room cost. We were told that tap water was safe to drink and the fresh fruits and salads safe to eat. We took them at their word, with no ill results. There were organized recreational programs and evening entertainment.

Friday morning began with scattered sunshine and a briefing by Paul Maley about eclipse viewing safety. We heard a presentation by a nineteen year old girl from the Czech Republic, a tour participant, who had developed image processing routines for combining images from several sources to glean additional information from past eclipses. At 2 PM we gathered in the lobby for the two buses to the viewing sites. One group was slated to go west with Paul Maley to Penonome Airport and the other group, which I was in, was bound for Coronado Airport east of the resort. My group was led by the



Miriam and David Findley at Penomone Airport. Photo courtesy of the author.

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Swiss astronaut, Claude Nicollier. The idea was, due to the instability of the weather, splitting the group into two increased the likelihood that at least one group would have satisfactory viewing conditions. We were delayed at the resort for an hour while Paul and Claude studied satellite weather pictures and consulted with weather experts at NASA, Houston. Finally, Paul's bus departed. Our bus was delayed for a spirited discussion between Claude, his wife, the bus driver and a resort employee. The employee insisted that we would not be admitted to the area of the Coronado airport, and we would have to lug our gear for an hour on foot to approach a viewing area. Claude was finally convinced that there was too much uncertainty to attempt to go to Coronado. He elected to join Paul at Penonome Airport.

Arriving at the airport, we discovered that it was the official viewing site of the Panamanian Amateur Astronomical Association. They even had a booth to sell sodas and commemorative tee-shirts. The airport was closed to aviation and several busloads of visiting observers from around the world as well as a large number of local residents were on-hand to witness the event. Despite the crowd we had no difficulty in locating an open spot at the end of the runway to set up our equipment. I set up my binoculars and tripod in a few minutes and began to look around at the others. I saw camera backs coupled to either large telephoto lenses or small, compact telescopes. Paul Maley had a camera on a Meade ETX-90. Some were using conventional film. I do not know the breakdown between film cameras and digital cameras, but both types were represented. Some had video cameras. Some had home-made solar filters, while others used commercial filters.

The sky was relatively clear at first

contact, but as annularity approached, a massive cloud began to encroach from the left. Claude thought that he might be able to drive away from the cloud. About a third of the group, those with easily portable equipment, joined Claude as our bus raced off the airport grounds, through the nearby town and off on a local rural road. As the time grew very close, Claude told the driver to stop. We set up on a side road near a large residence. Using his GPS apparatus, Claude announced that we were 2.4 nautical miles north of the centerline. He called out the seconds to annularity as we observed. The sky grew dark, like at twilight, but the sunlight was still too intense to observe directly. The cloud cover had increased too much to see the solar corona, but we could see the annularity for a second or two and a suggestion of "Baily's Beads," regions of dark and light around the annulus due to irregularities on the lunar surface. It turned out that the group that remained at the airport enjoyed marginally better viewing conditions than ours, as well as true annularity. However, since we were in a rural area, we could hear the birds begin their evening routine and the tree frogs start their evening calls, two or three hours before normal. Even if viewing conditions were not perfect, I was ecstatic to be there and thrilled to have witnessed the eclipse. We returned to the resort in great spirits.

Saturday was a free day to enjoy the resort. Miriam and I went on a bird-watching expedition to a highland rain forest. In the late afternoon, Claude Nicollier gave a slide presentation on his spacewalk to repair the optics in the Hubble Space Telescope, and his thoughts about the future of telescopes in space. We had a farewell dinner for the group in one of the specialty restaurants, capped by a special commemorative cake supplied by the resort. After dinner Claude led a group down to

the beach to observe the southern night sky. On previous evenings the night sky had been obscured by clouds, but on this night the viewing was marvelous. As my eyes dark-adapted, I could make out the southern cross (Crux), Alpha Centauri, Beta Centauri, and the globular cluster, Omega Centauri. Omega Centauri was an easy naked-eye object and spectacular in binoculars. The Eta Carina Nebula was striking. I was awestruck. At 4 AM Sunday morning we had a wake-up call to prepare for the trip to the airport. My wife and I joined Claude and his wife for breakfast. Afterwards Claude and I went to the beach to see Mars in Capricorn. Just before sunrise, Paul called us all out of the two buses to witness an Iridium flare. It was right on schedule. The bus drivers and tour guides were very impressed; they were definitely prepared to promote Paul to shaman status. We reboarded the buses for our return trip. Our eclipse tour was concluded. It was one of the highlights of my life to have participated. Now, I am planning for my next one. 2009 in Shanghai for sure! Maybe Turkey or Libya in 2006?



The photo was taken, as annularity was ending, from a C-90 telescope with a Canon "Rebel" SLR digital camera with the solar filter removed, ISO=100, and a 1/4000 second exposure. This photo was taken by Ernie Piini. You can see Ernie's story of the eclipse in the HTML version of this newsletter.

Solar System Stats for June 2005

These statistics are available in the online version of the Ephemeris.

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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 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

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
3	4" Quantum S/C	Hsin I. Huang
7	12.5" Dobson	Tom Fredrickson
8	14" Dobson	Jan Lynch
14	8" f/8.5 Dob	Colm McGinley
15	8" Dobson	Scott Pelger
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	Vivek Kumar
27	13" Dobson	Steve Houlihan
28	13" Dobson	Anupam Dalal
29	C8, Astrophotography	Mark Ziebarth
32	6" f/7 Dobson	Sandy Mohan
34	Dynamax 8" S/C	Yuan-Tung Chin
37	4" Fluorite Refractor	Steve Sergeant
38	Meade 4.5" Digital Newt	Tej Kohli
40	Super C8+	Mike Macedo
41	18" Sky Designs Dob	Len Bradley
42	11x80 Binoculars	Ritesh Vishwakarma

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
10	Star Spectroscope	Jim Albers	3/18/05
11	Orion XT6 Dob	John Durant	4/12/05
13	Orion XT6 Dob	Ravinder Pal Singh	4/14/05
35	Meade 8" Equatorial	Ethan Romander	6/6/05

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	?
6	8" Celestron S/C	Karthik Ramamurthy	4/8/05
9	C-11 Compustar	Bill Maney	Indefinite
12	Orion XT8 Dob	Mike Koop	Transit
21	10" Dobson	Michael Dajewski	Repair
33	10" Deep Space Explorer	Ion Coman	4/22/05
36	Celestron 8" f/6 Skyhopper	Saman Behjat	5/28/05
39	17" Dobson	Rob Hawley	2/28/05

Waiting list:

8	14" Dobson	Colm McGinley
33	10" Deep Space Explorer	Zachary Jacobs
37	4" Fluorite Refractor	Bob Leitch

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