The Longmont Astronomical Society, a nonprofit educational organization, was founded in 1987 to enhance public awareness of amateur astronomy. The society’s activities include lectures on various astronomical topics and related space sciences at local schools and other organizations, monthly public sky observing sessions, and monthly meetings featuring select speakers. The society serves the Boulder, Estes Park, Longmont, and Loveland, Colorado areas. Regular meetings are held on the third Thursday of every month at 7:00 PM in the Longmont Christian School basement, 550 Coffman St., Longmont. Annual dues are $20. All meetings are open to the public. Visit the LAS web page at http://laps.fsl.noaa.gov/cgi/las.cgi for timely reminders of upcoming events and maps to monthly star party sites.

Impressions of the
Leonid Meteor Shower, 2001

Since I didn’t get lynched the last time I tried this, I’ll repeat the experiment in editorial license and put an article together from cut and pasted comments of LAS members on the FRAC e-mail list. The idea is to give different perspectives on this memorable event in a chronological order. My apologies once again to the original writers. - Jim Sapp, Editor

The Nutshell Version:

Kimon Berlin: “We had a FANTASTIC time; I can understand why people would want to travel to see meteor storms just like eclipses.”

Jim Crane: “This is a meteor storm I will remember for a lifetime!!!”

David Dunn: “This past year has provided a lifetime of great observing memories and last night may have made it the best ever!”

Dave Ewing: “Well folks, I’m jealous! If you were all wondering what happened to those clouds on the satellite images, well, they followed me to central Nebraska.”

Gary Garzone: “WOW!”

Brian Kimball: “AWSUME BABY...”

Karen Mendenhall: “Quite a show! Let’s do it again!”

Jim Sapp: “In a word: SPECTACULAR!!!!”

Dave Street: “Even from less-than-perfect skies, the show was the best meteor shower I’ve seen in my 35 years of observing (which began the month AFTER the great Leonid Shower of 1966).”

Tom Teters: “It was AWESOMEEEeeeeeee!!!!!!!!”

Ray Warren: “It was a fantastic show.”

The Rest of the Story:

David Dunn at Cactus Flats: “Starting out the weekend Friday night provided another evening of the very good transparency we have been experiencing lately. Deep sky objects were nice and contrasty with the seeing better than the previous weekend (though still about 5/10). Our hope to catch some early Leonids was thwarted by a thick fog bank that moved in right at midnight. Saturday afternoon it was obvious that the "flats" would play host to a much larger crowd. By twilight there were more vehicles than I had ever seen in the field and folks would continue to arrive all night.”

Tom Teters at Cactus Flats: “There were at least 60 people at Pawnee, about 30 cars, folks joining the fray until 2:30am.”

Jim Sapp at Cactus Flats: “That had to be an all-time record attendance at Cactus Flats. I heard someone say they stopped counting after thirty-some-odd cars had shown up. There were still cars coming and going up CR65 at 4 a.m., much to the consternation of all the dark-adapted and film-exposing folks there.”

Gary Garzone at Cactus Flats: “I thought maybe we were at a summer star meet with the crowds that showed up at Cactus
Flats. Biggest crowd of people (60 or so I would guess) Cactus flats has ever seen for any event in the past 15 years we have been using the site.

David Dunn at Cactus Flats: “Early evening had the atmosphere of a large party with folks mingling around the field sharing telescope views and stories. You could hear the excitement in people’s voices as they discussed the impending meteor shower. As the night progressed the clouds over the front range began to slowly move over us and covered the sky with a thin layer that you could still see bright stars through.”

Jim Sapp at Cactus Flats: “A calm sunset turned into a fairly chilly evening (about like Foxpark in the summer) and there were a lot of good views of planets and deep sky stuff to be had since there was a tremendous number of good sized scopes in attendance. Toward the later hours of the evening patchy clouds rolled in, then dissipated shortly before another wave obscured most of the sky for a while.”

Ray Warren east of Sterling: “On finding that Pawnee was clouded over, we [Ed.: One of the stereo photography experiment groups] zipped out to the dark skies 10 miles East of Sterling. The skies were clear from horizon to horizon until morning.”

Brian Kimball near Red Feather: “Dee and I put on our shower caps and headed up to the observatory. Got up there in the dark and set everything up for the night. Did a quick tour of some common objects and then the clouds came in. Closed the roof around 8:00 and got some shut eye.”

Dave Street in Erie: “Thin clouds abounded when I stopped working on camera and trip-to-Pawnee plans at about 11 p.m. Decided to pack it in and do a re-check around the predicted max (3am).”

Gary Garzone at Cactus Flats: “We had the fellow that leases the land show up with his wife and son and his wife and their kids for an awesome showing of Saturn, Jupiter, Orion, and more on my 30 scope earlier in the evening. I was very glad they came out for this event, because it does not get any better than that. We started at 6 p.m. and by seven we had already done 10 objects. By midnight we had two summer nights worth of views in, and still had 4 or 5 hours more of constant meteor barrage to watch. I can not remember a better night line up.

“Our prayers for clear skies worked out well as the sea of clouds parted for our viewing pleasure. Around midnight the clouds started to roll in so we covered up the scopes to get ready for the meteor storm, and the clouds did part for us before the big event of the night.”

David Dunn at Cactus Flats: “Nearing midnight several of us decided to cover our scopes in order to appease the gods and hopefully clear away the clouds that were threatening to put a damper on our viewing. Right on cue we started to see Leonis. One of the first ones I saw started SE about 30 degrees altitude and actually skipped 3 times through the atmosphere as it traveled about 120 degrees across the sky! The clouds were surely hiding some meteors from view but there were still enough bright ones to keep everyone entertained.”

Gary Garzone at Cactus Flats: “An early one that skipped through the sky was an awesome start for even better fireballs to come.”

Jim Sapp at Cactus Flats: “Around 11:30 or so most folks had covered their scopes and taken to their lawn chairs to keep an eye on the intermittent but fairly slow and bright Taurid meteors that were still putting on their show. Around 12-ish the advanced scouts from the Leonids began arriving, the first or second of which gave us a great preview of what was to come as it’s bright green demise came screaming out of the east and skipped three or four times off the atmosphere leaving a long, punctuated yellow train. It was followed by several more bright meteors visible through the murky sky that increased in number fairly steadily through the next two hours as the sky cleared to a wonderful transparency over most of its dome by 2 a.m.”

Karen Mendenhall in Boulder: “I must say, that even from a light polluted sky, and from a porch where I could only see about 35-40 percent of the sky (a strip from Orion in the south, all the way north along that swath of sky), this was the best I’ve seen! I know I missed many because my view was so blocked and because of light pollution. I kept going out to look at the sky starting about 11:00 checking on clouds. At about 1:30 I was getting things ready (planning on putting my lounge chair and goosdown sleeping bag on my small porch) and was peeking out the window of my screen door when I saw an extremely bright golden meteor! Wow! My first of the night! That was about 1:30 and was all it took to get me into higher gear.”

Brian Kimball near Red Feather: “When the alarm went off at 1:00 a.m., I looked out the door and ‘OH MY GOD!!!’ Billions and Billions of stars and some streaks going on. It didn’t take me long to open the roof and fire up the camera. I opened the shutter at 2:00 a.m. and took about six 30 minute exposures.”

Karen Mendenhall in Boulder: “I was out and warm and comfy by 2:00 and was listening to the NASA channel narrate and tour the night sky. It was fun. They would be narrating, or just telling about a constellation and then would gasp or exclaim because they saw a meteor.”

David Dunn at Cactus Flats: “By 2:30 a.m. the sky had opened up considerably and things were starting to really get going. The occasional fireball would light up the field to the cheers of all in attendance, usually leaving a "smoke" trail that could be seen for up to several minutes.”

Dave Ewing in North Platte, Neb.: “I woke up to my alarm at 3 a.m. (central time) and went outside to the brightly lit hotel parking lot. I was greeted by the dewiest conditions I can remember seeing since I grew up back east. Being a trooper, I walked to the back of the parking lot and found a space on the ground shaded from direct light by a shed. There were some reasonably big gaps in the clouds that made it obvious that the transparency above that layer was spectacular. When Orion was visible, I could see the great nebula naked eye with no trouble. Overall, I’d estimate that the cloud cover varied from 50% to 90% over the 45 minutes that I observed.

“During slightly more than a 30 minute period I counted
31 meteors varying in magnitudes from 2 to -3. Now, that doesn't sound like much, but consider that it is still three times the rate I remember seeing two years ago from Steve Lynch's rather dark front yard. It was obvious to me at the time that anyone at a dark site was seeing LOTS of meteors. I'm glad so many of you managed to get to Pawnee and other places with less clouds. At least I don't feel completely left out...." 

Jim Sapp at Cactus Flats: “From roughly 2 a.m. through the remainder of the night, it would have been utterly impossible to count the meteors. In any given 10-second period over the next two and a half hours, there may have been one or two individual seconds that no meteors were seen by any single observer, but the remaining eight seconds each contained as many as six or eight meteors! It was very common (every minute) to see three or four good bright ones arrive at once, or in split-second succession. No part of the sky was favored, as they were visible at any given moment no matter what direction you were facing. Incredible! From time to time a bright yellow Taurid would "swim upstream" or cut across the path of the much-faster Leonids, which enhanced the show as well.” 

David Dunn at Cactus Flats: “By the time of the predicted peak at 3:00 a.m. we were in a full storm, some were shouting out counts of up to 50 meteors per MINUTE! Every direction you looked there were meteors, sometimes 2 or 3 at the same time, sometimes more. It was without a doubt the most fantastic show I have ever seen. I had heard predictions of the peak lasting from 10 to 30 minutes, thankfully they were not even close. Meteors fell at a high rate for over an hour.” 

Ray Warren east of Sterling: “We split into two teams and exposed one roll of Kodak Max 800. Terry ran a video recorder to capture meteors if lucky, but mainly to get the sound. At one point, Terry suggested, "I'm going to say 'MARK' every time I see a meteor." I agreed to do the same looking West. The result was hilarious as well as revealing as to the magnitude of the storm. There is no doubt that the peak was at least 1 a second (3,600 an hour).” 

Gary Garzone at Cactus Flats: “We were all looking in different directions and calling out where and how many. We were hitting at least 8 to 10 per second at times. I would be yelling out four, five, or six and others would be calling out theirs too.” 

Karen Mendenhall in Boulder: “When it was supposed to be peaking I found myself getting very frustrated because these beautiful bright meteors would begin in my field of view and then disappear behind my house! Over and over and over this happened, because my field was so narrow. So from shortly after 3:00 to probably 4:20 or so, I stood, or sat on the railing of my porch, craning my neck around to get a broader field of view. I saw more meteors between 3:30 and 4:00 than prior to that, but maybe that is because of my position changing. Not more brighter ones, just more fainter ones, and many of those were to the north. I had not been looking that far north very much before then, but the north has less light pollution, so that's probably why. Since the density would come and go, sometimes I went 30-45 seconds without seeing one, but then I would see 10 in a matter of a few seconds. They did seem to travel in "packs". I thought I saw lots of little doubles as well.” 

Kimon Berlin at Cactus Flats: “This definitely qualified as a storm by my criterion ("too many to count"). After a while, I was overwhelmed during one-minute counts (>100 meteors); I did a few 5-second and one-second counts, and I would guess the peak rate at 10,000-15,000 per hour. Even when you were looking at the persistent trail from a particularly bright meteor, you could see dozens of small ones zipping by. Woohoo! The peak lasted much longer than estimates.” 

Jim Sapp at Cactus Flats: “If on the average we were EACH seeing even one meteor per second (but actually much more), that would work out to 3,600 per hour per observer, which when corrected to ZHR would be a much larger number. I'm very sure there were periods when the rate easily exceeded 10,000 and possibly even more.” 

Gary Garzone at Cactus Flats: “The meteor storm was super spectacular. We were counting up to 10 sometimes in one or two seconds, so 3,000 per hour would be a low estimate. 10,000 is truly realistic. Like Kimon said it was futile to even keep trying to count the numbers. Some were so bright you could see the flash and have time to turn around and still see it, with one that took 5 minutes at least for its trail to disappear into the dark night sky. We were like the 4th of July crowds watching the great fireworks show, only way better than any fireworks show.” 

Tom Teters at Cactus Flats: “We approximated 10,000/hr and the main shower lasted at least 2 1/2 hours. There were at least 5 bolides that exploded.” 

Jim Sapp at Cactus Flats: “Some of the really bright ones lit up the ground and were seen reflected off of cars and telescope tubes. They were usually a bluish-green and left blue-green trails that would glow in the sky for several minutes as the upper atmospheric winds would twist them into snake-like, writhing forms.” 

Ray Warren east of Sterling: “There was one particularly memorable meteor that fell out of Leo toward the East. It was very bright then exploded at the end. It left a trail that persisted for several minutes. The trail, over time, was actually blown into a loop toward the South.” 

Karen Mendenhall in Boulder: “I saw many very bright Leonids, and even a few too low to see down toward the radiant but saw them reflected in my window! I also saw many very fast fainter ones, that under a dark sky were probably pretty good ones! Many fairly long trails, but none stayed around too long. One long one way up north hung around for a couple minutes.” 

Brian Kimball near Red Feather: “I've never seen so many meteors. The brightest one I saw was by the Big Dipper that exploded and left a smoke trail for 15 minutes. About five times the ground lit up during the night.” 

Jim Crane in Erie: “…a great CELESTIAL SHOW observing from 02:30 until 05:45 in Erie! Thank goodness for coffee!!”
Dave Street in Erie: “Over slept (rats!), but did wake up at 4 a.m. (whew & yay!) and popped out for a peak. Was greeted/treated by a nice assortment of -3 to 1st magnitude meteors in only a few seconds. After a quick detour back into the house to roust the other sleeping inhabitants, all went back out for another look.

“My backyard conditions were OK (for a "city site") with all stars in Little Dipper plainly visible (for a limiting magnitude of around 5.5). Concentrated on the overhead and northern half ("anti-Denver") portion of the sky. With approaching dawn (and LOTS of meteors), elected to NOT do an hourly count. Instead, counted meteors in 10 second chunks for the next hour. Quickie summary: ALWAYS had at least one meteor every 10 seconds with a "peak" of 8. Meteors were coming on average of once every 4-5 seconds for an "official" (non ZHR adjusted) rate of 720-900/hour. Saw at least three fireballs that cast perceptible shadows.”

David Dunn at Cactus Flats: “I did not notice any fall off until well after 4:00 a.m. Even then there seemed to be more fireballs. By this time the Zodiacal Light was brightening the eastern horizon, funny because this usually brings nice reactions but it seemed to be an afterthought to most due to the "other" activity going on.”

Tom Teters at Cactus Flats: “...the 2 hour Zodiacal Light went to the zenith at it’s max. WHEWWWwww!!!”

Jim Sapp at Cactus Flats: “The Zodiacal Light was incredibly bright! It seemed to have color too. Very nice!”

Gary Garzone at Cactus Flats: “We definitely noticed the Zodiacal Light that stretched high up in the night sky. Pretty strange looking. Several different people in the crowds commented on it.”

Ray Warren east of Sterling: “When the Zodiacal Light threatened from the East, the cameras were simply re-pointed to the West.”

David Dunn at Cactus Flats: “Fighting exhaustion and cold (the wind had come up considerably) I lift the sack with visions of meteors still falling through my truck’s windows.”

Karen Mendenhall in Boulder: “When I came in at 4:30 I checked the satellite and it looks like Pawnee fared very well! Excellent!”

Ray Warren east of Sterling: “Another memorable one entered very close to the radial source in Leo. It was unique in that it appeared to rest in one place and just shine. When it went out, it too left a visible trail (all be it very short) that appeared to have a bend in it.”

Dave Street in Erie: “One VERY nice fireball about 4:40 a.m. between the "Sickle" of Leo and Regulus (i.e., near the radiant). Several noteworthy items about this fireball: 1. VERY bright (much brighter than Venus at greatest brilliancy, guestimate -6); 2. Much slower and shorter than most of the other Leonids (whoa!, of course, as it was VERY foreshortened since it was an incoming meteor... DUCK!); and 3. Very persistent train. It left a bright patch ("Scutum Cloud-ish") that slowly faded to Beehive/Double Cluster-ish and finally faded to M31-ish after about three minutes.”

Jim Sapp at Cactus Flats: “One that sticks in my mind came straight down from the radiant with two blue explosions followed by a final yellow burst. That was as most of the remaining die-hards were crawling into the sack about 4:30 a.m., but several of us whooped for it! The show was still going strong, but a VERY chilly north wind was too, and we had all been out under the late autumn sky for a good ten hours by then. The cold had taken its toll.”

Dave Street in Erie: “Rate seemed to fall off by 5:00 a.m. and twilight started to close the curtain by 5:30. *SIGH* A nice display and though I've no fotos, all the memories are perfectly exposed and in focus!”

Kimion Berlin at Cactus Flats: “I left at 5, and I must have seen another 50 through the windshield, falling in the west!”

Gary Garzone at Cactus Flats: “The cold front moved in about 6 a.m. when the cold winds from the north west started to howl. Longest astronomy night of viewing ever for me - almost 11 hours straight through the night into the pre-dawn glow. We usually do not make it till those early morning hours, so this was kind of a marathon run through the cold night on the high plains. Very cosmic.

“After everything was packed and we were on the road heading out (6:00am), A really nice meteor fell right in front of us. The trail resembled the boiling effect that is seen in time lapse photos of clouds. It had a green tint too. One final gift from a night of WOW.”

Jim Sapp at Cactus Flats: “The wind became fairly ferocious by 7 or 8 a.m. and everyone was pretty quick to get their scopes torn down and hit the road.”

Final Words:

“Just a fantastic night that surely will be talked about at future star parties for a long, long time to come.”
- David Dunn

“I think I’ll follow Tom Teters’ advice and put my 10,000+ unspent wishes on Ebay.”
- Kimion Berlin

“On any given night out under the sky we usually think it was a pretty good meteor night if we see three or four bright ones, but that night it was impossible to miss three or four good bright ones in a single minute, not to mention the multitudes of little streakers, and the occasional VERY bright one. All of us readily agreed that we had never before seen anything that came near the display they put on! I’ll remember it the rest of my life for sure, and would love a repeat performance!”
See Ya in the Dark!
- Jim Sapp
MINUTES
of the
LONGMONT ASTRONOMICAL SOCIETY’S
MONTHLY MEETING
held on
Thursday, 15 November 2001

Initially, it looked like we were going to have the
meeting in the parking lot but the bearer of the key showed at
7:20 and we gratefully went in from the cold. Twenty-nine souls
signed the roster this month including three visitors.
Nominations were opened for the officer’s positions for
the coming year. Non-declined nominations were as follows:

- President: Dave Street and Bob Spohn
- Vice Pres: Gary Garzone
- Sec/Treas: Micheal Hotka
- NL Editor: Gary Garzone and Bob Spohn
- AL Cor: Jim Crane and Bob Spohn
- WebMaster: Steve Albers
- Nominee Albers, Hotka, and Spohn were not present
to decline. The nominations were closed, but will be reopened at
the December meeting.

The remaining discussions of the evening revolved
around the upcoming Leonid meteor shower, films for meteor
photography, the recent auroral activity, possible near town but
fairly dark sites, and radio meteor observation techniques.
The meeting came to a close around 8:45.

LAS
ANNOUNCEMENTS

If you are of a mind to recycle, and would like to make
a small contribution to the LAS telescope making fund,
bring your recycled aluminum cans to the regular
meeting each month for collection. Proceeds from this
activity will help fund a telescope for a local school or
other worthy recipient.

Back Issues Available
I have a number of left-over copies of the LAS Journal
for 2000 and 2001 cluttering up my file cabinet. If you
would like any of these, give me your list to verify
availability then make a donation of 50 cents per issue
to the LAS general fund to cover postage and I will
send them to you. First come first served. When they’re
gone they’re gone.
- Editor

L.A.S. CLASSIFIED ADS

This is a service provided free of charge by the LAS for the members and associates of the society.

WANTED TO BUY

USED COMPUTER, at LEAST 250Mhz,
with printer, scanner, and astronomy
software such as The Sky ver. 5.0 level II or
III, and Starry Night Deluxe. Call Michael
Hutchinson at 303-776-5323 with the Colo.
Relay: 1-800-659-3656 after 5:30 pm or
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FOR SALE

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shafts mounted in 5 ½ inch inner diameter
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motion is ~11 inch 440() tooth worm wheel.
This is an ugly but accurate mount with
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the field of a 100X eyepiece. Perfect for
solar system study with a large Cassegrain.
Comes with steel pier described below and
two 7 inch diameter knurled and threaded
stainless steel counterweights for the
threaded counterweight shaft. Also have
short pier on 1 inch steel plate for
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currents and half the thermal expansion of
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STEEL PIER for Cassegrain or refractor.
Central column is 6 inch heavy steel pipe
welded to three 3 ½ inch steel legs. Base of
triangles is 2 inch pipe and heavy steel bars
with three large steel Freuchau wheels (like
on a semi trailer) and hinged T-bar handle
for rolling it out of a garage, etc. Center can
also be anchored to permanent ground
position when in use (highly suggested). Top
of central column is 56 inches high. When
used with mount described above, center of
telescope is over 6 feet high. Gloss black
Rustoleum finish. First $150 takes it. You
will need a pickup truck without topper to
transport. Call Jim at 303-776-5098 6-8 p.m
or e-mail jstars@worldnet.att.net Serious
inquiries ONLY, please.
Out with the Old...

A Letter from the Editor

Hi Folks,

It was with trepidation that I took the helm of this little literary boat with my first issue in January 2000, but it soon became a new and interesting hobby in its own right, and I quickly found the voyage to be exciting and surprising. Now, as another year turns, it is time to bring her back to port for refitting and a change of pilot. It is with reluctance that I put this job aside, but other projects have been ignored too long and their cries for attention can no longer be ignored. I constantly hear the squeals of many wheels that have not been oiled for more than two years now, and I need to get those trains rolling again. New destinations await and the time invested in the Journal must be reclaimed for the schedule. I hope the new editor (whoever that may be) will find the trip as rewarding as I did.

It has been an honor to serve the LAS as editor the past two years. This group is full of interesting and talented people and I have counted myself lucky to have made the acquaintance and found the friendship of many, and look forward to many more years of sharing photons in the field. Via con Dios, amigos!

See Ya in the Dark!
- Jim Sapp

P.S. Also, I would ask that you be kind to your new editor. As it was learned by the last two or more people that served in this position, one of the more frustrating aspects of this job is the meager (or nonexistent) offerings of material by the club's membership for publication. There is a world of knowledge and experience in this club; a vast but seemingly untappable resource. On behalf of the new editor, I would ask again that you write some articles to be published for the enrichment of the newcomers to this hobby and the club in general. Consider taking on a monthly column, and be faithful in it. Many hands make light work.

NOTES FROM THE DARK SIDE

Cactus Flats, 9 & 10 November, 2001

Greetings All,

After Friday night’s viewing and a good sleep at home it didn't take much thought to decide to head back out to the "flats" Saturday at noon to take advantage of the excellent conditions and get in some solar viewing. Knowing Steve was there with his Ha scope made the decision even easier. Having packed up the C5 before I left so I could use it with my prominence filter, my plan was to try and get some digital pictures this afternoon. I was glad to see that Steve and Tom had already mounted the Helios onto Tom's C14. It didn't take long to realize I had left the tripod home for the 5". Abandon plan "A" and move on to plan "B"! They were already taking pics with Steve's camera so I rigged mine up and started trying different settings. Using a 32mm plossl afocally gave the best images.

By sunset the field was beginning to fill, max-ing out at 12 vehicles and scopes. Some diehards returned from Friday night also.

Once again the temps dropped as fast as the setting Sun but stabilized around freezing for several hours. The transparency was excellent with the seeing only slightly improved over the previous nights viewing. Dan treated us to a failed geosynchronous satellite that on predicted nights flashes to a naked eye brightness every 20 seconds. This lasted for about 10 minutes though it could be easily seen in the eyepiece for longer. Wanting to take advantage of the transparency my focus was on Galaxy groups and Planetary nebula.

As the evening progressed the crowd began to thin, by 11:30 the cold and fatigue began to set in. Satisfied with nearly 10 hours of observing over two nights along with the solar session from the afternoon I decided to pack it in and head home. Clear Skies,
- David Dunn

Longmont, 9 & 10 November, 2001

I could not make Pawnee this past weekend, but did set up in my yard both Friday and Saturday for two of the best clear and sometimes steady seeing nights for these urban skies. Saturn was awesome at times and Jupiter around 1am Friday night. You could see shadow of a moon coming across easily on the surface. Real cool to see. Also new comet on Saturday night. Very easy to find.
- Gary Garzone
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| Comet C/2000 WM1 LINEAR                                 |                     | 2001 03|
| Comet C/2000 WM1 LINEAR                                 | Larison, Dave       | 2001 01|
| Comet Lee                                              | Stencil, Bob        | 1999 05|
| Extra Bright Full Moon                                 | Degenhardt, Scott   | 1999 12|
| Future Messier Marathons                               | Sapp, Jim           | 2000 04|
| Highlights for 2001                                    | Sapp, Jim           | 2000 12|
| Martian Flare Events                                   |                     | 2001 05|
| Nova in Sagittarius                                    | AAVSO               | 1998 04|
| Rare Flyby of Aten Asteroid                            | Sapp, Jim           | 2001 05|

| **Columns**                                             |                     |        |
| Const. of the Month Coma Ber.                          | Garzone, Gary       | 2001 03|
| Const. of the Month Ophiuchus                          | Garzone, Gary       | 2001 06|
| Const. of the Month Virgo                              | Garzone, Gary       | 2001 04|
| LAS Ten Years Ago Aug 88                              | Durren, Melinda     | 1998 08|
| LAS Ten Years Ago Dec 88                              | Durren, Melinda     | 1998 12|
| LAS Ten Years Ago Feb 89                               | Diehl, Melinda      | 1999 02|
| LAS Ten Years Ago Jan 89                               | Diehl, Melinda      | 1999 01|
| LAS Ten Years Ago Jul 89                               | Diehl, Melinda      | 1999 08|
| LAS Ten Years Ago May 89                               | Diehl, Melinda      | 1999 05|
| LAS Ten Years Ago Nov 88                               | Durren, Melinda     | 1998 11|
| LAS Ten Years Ago Oct 88                               | Durren, Melinda     | 1998 10|
| LAS Ten Years Ago Sep 88                               | Durren, Melinda     | 1998 09|
| Solar System Gleanings                                 | Mendenhall, Karen   | 2000 10|
| Solar System Gleanings                                 | Mendenhall, Karen   | 2000 11|
| Solar System Gleanings                                 | Mendenhall, Karen   | 2001 01|
| Solar System Gleanings                                 | Mendenhall, Karen   | 2001 03|
| Solar System Gleanings                                 | Mendenhall, Karen   | 2001 05|
| Solar System Gleanings                                 | Mendenhall, Karen   | 2000 12|
| Solar System Gleanings                                 | Mendenhall, Karen   | 2001 06|

| **Corrections**                                         |                     |        |
| 2000 Aug, Misspelled name                               |                     | 2000 09|
| 2000 Feb, GRS labeled March                            |                     | 2000 03|
| 2000 Jan, Pallas Chart                                 |                     | 2000 02|
| 2000 Mar, Omissions Messier List                       |                     | 2000 04|

| **Equipment Notes**                                     |                     |        |
| that are not listed in Featured Articles                |                     |        |
| A Dew Prevention Tip                                    | Sapp, Jim           | 2000 11|
| A Poor Man's Telrad                                    | Sapp, Jim           | 2000 02|
| A Simple High-Contrast Eyep.                           | Sapp, Jim           | 2000 06|
| Astro Software Comments                                | Sapp, Jim           | 2000 01|
| Astro Software Comments                                | Warren, Ray         | 2000 04|
| Astro Software Comments                                | Simpson, Brian      | 2000 04|
| Astro Software Comments                                | Sully, Archer       | 2000 04|
| Cementing Lenses                                       | Sapp, Jim           | 2001 04|
| Drivin' Juice (Inverter)                               | Sapp, Jim           | 2001 07|
| Got the Shakes? Tripod Feet                            | Sapp, Jim           | 2000 03|
| Mad Marathon II/Help                                    | Sapp, Jim           | 2001 02|
| Need a New Eyepiece Case?                              | Sapp, Jim           | 2001 01|
| New Tube Material Hollowood                           | Sapp, Jim           | 2000 07|
| Night Vision Info                                      | Albert, Harry       | 2000 11|
| Secondary Spectrum                                     | Sapp, Jim           | 2001 02|
| Willian Yang Megrez 80mm                               | Sully, Archer       | 2001 03|

| **Featured Articles**                                   |                     |        |
| ATMing in the Great North West                         | McBride, Kreig      | 2000 05|
| Arizona Adventure with SAC                             | Garzone, Gary       | 2001 04|
| Astro Pronunciation                                    | AL/Larison, D.      | 1999 07|
| Astro Pronunciation II                                 | AL/Larison, D.      | 1999 08|
| Choosing Binoculars                                    | Sapp, Jim           | 2000 06|
| Collimation, Newtonian                                 | Sapp, Jim           | 1998 10|
| Dates, Diameters, Declinations (Mars)                  | Sapp, Jim           | 2001 02|
| Eclipse Geometry Illustrated                           | Shekeruk, Randy     | 1999 12|
| Eclipse Madagascar                                     | Sully, Archer       | 2001 07|
| Eclipse Madagascar                                     | Mendenhall, Karen   | 2001 07|
| How Big is your Exit Pupil?                            | Sapp, Jim           | 2000 01|
| ISS Brightness, A Note About                           | Peat, Chris         | 2000 12|
| Light Pollution                                        | IDA                 | 1998 11|
| Marathon list and charts                               | Sapp, Jim           | 2000 03|
| Observing 101, Learning to See                         | Sapp, Jim           | 2000 02|
| Observing a Dream, ATMs Obsvity                       | Miller, Steve/Dunn  | 2000 08|
| Observing in Cold Weather                              | Dunn, David         | 2000 10|
| Outdoor Lighting                                       | NELGAP              | 1998 04|
| Panic and Terror, Mars' Moons                          | Sapp, Jim           | 2001 05|
| RMSS 2000, A Report From                               | Sapp, Jim           | 2000 07|
| RMSS 2001                                              | Sapp, Jim           | 2001 07|
| Red Revisited (night vision)                           | Bond, Gordon        | 2000 09|
| S is for Saros                                         | Sapp, Jim           | 2000 10|
| Scrouning, par Excelence (ATM)                          | Sapp, Jim           | 2000 09|
| Sporadic Meteors                                       | Sapp, Jim           | 1998 03|
| Star Party Checklist                                   | Shekeruk, Randy     | 2000 12|
| Upcoming Eclipses                                      | Misc.               | 2000 08|
| WUTS 2000, Reports From                                | Sapp, Jim/Misc.     | 2001 09|
| WUTS 2001, Impressions                                 | Davis, Mark         | 2001 04|
| What is NAMN?                                          | Larison, Dave       | 2000 02|
| What is an Iridium Flare?                              | Sapp, Jim           | 2000 03|

| **Flyers or Announcements**                            |                     |        |
| 3rd Annual Sterling Star Party                        | Garzone, Gary       | 2001 02|
| A Call for Volunteers                                 | Planck, Andrew      | 2001 02|
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Call for CCD Obs Temple 1
Camp Jack Set for Summer
Chalk Up Messier Cerfs!
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Great Plains Star Party
Help Wanted (JPL Engineers)
MARS Annual Meeting 98
Messier Marathon 2000
NASA Eclipse Ref. Book
NASA Student Involvement
NYAA Award
Online Astronomers Educ. Program
Pawnee Grasslands Star Party
Point the Hubble
RMSS 1999
SETI@Home
See What HST Sees on the Web
Stamp Out Boring Space Acronyms
Star Park/N. Sterling Res.
Stars, Black Hills, Buffalo
TSP 98
The Denver Sky Show
Triton Watch, Call for Observations
WUTS 1999
WUTS 2000, A Plug For
Whirlpool Star Party, Ireland
Wyoming Star Summit 99

Humor

100-Billion Miles Telescope
More than One Way to Skin a Cat
You Might be a Physics Major if...

Letters/Comments

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ATM Award Winner
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Atta-Boys/Girls
Catch a Falling Star
Club Scope Stolen
DST Anyone? Comments
DST Anyone? Comments
DST Anyone? Comments
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Editor's Farewell
Editor's Farewell
Editor's Hello and Survey
Flats Flattened
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Light Pollution Observation
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Light Pollution Victory!
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President's Desk (Roller Coaster)
President's Short Note
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2MASS Survey Online
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CHANDRA Links Pulsar to SN
CHANDRA SN1987A Blast Wave
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Deep Space 1 to Cmt Borrelly
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Earth Viewing Satellite
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Galileo Europa Fault
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Galileo Wet Past Ganymede?
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Jupiter's Storms Collide
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LAS Banquet 2001 Review
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Light Pollution News
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MGS Completes Prime Mission
MGS Img. Suggest Mars Water
MGS Mars' Burried Channel
MGS Mars' Polar Regions
MGS Martian Lake Evidence
MUSES CN Mission to Asteroid
Mars Climate Orbiter
Mars Images on Web

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Contributors to this month's Journal:
Special thanks to MCDATA Corporation for the use of their copier. Sorry if I missed anyone!
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- **January 1**: New Year's Day
- **January 2**: Quadrantid meteor shower peaks this morning.
- **January 4**: Mercury at greatest eastern elongation.
- **January 6**: Venus at superior conjunction.
- **January 7**: Earth at perihelion
- **January 10**: Mars opposition
- **January 11**: New Moon Star Party
- **January 12**: 1st Quarter Public Star Party
- **January 13**: L.A.S. Monthly Meeting 7 p.m.