Gemini

a publication of the Minnesota Astronomical Society

DECEMBER, 1989 VOL. 14, NO. 6

OBSERVATIONS OF COMET OKAZAKI-LEVY-RUDENKO

By Howard Doweiko

The approach of comet Okazaki-Levy-Rudenko has been one of anticipation for not only myself but for thousands of other amateur astronomers across the country. Although there are hits that this comet might fail to live up to its earlier predictions, it has still provided a fine target for interested amateurs.

On the night of Oct. 23, I took my 10-inch Schmidt-Cassegrain telescope to one of my primary observing sites, a golf course north of Austin. While this site suffers significant light pollution to the south, it offers a fine view of the skies to the north, east and west.

After setting up the telescope, I waited for darkness. Polar alignment was achieved with little difficulty. Using the coordinates provided by Sky & Telescope's telephone hotline, "Skyline", I was able to scan the appropriate section of the sky for the comet.

At first I did not find the comet. The western sky was still too bright for a dim object such as comet Okazaki-Levy-Rudenko, which was estimated to be only magnitude 6 to 6.5 at that time; however, at about

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Comet at 92X
R.A. 14h14' Dec. +27°, Oct 23, 1989

DECEMBER MEETING

The next regular meeting is scheduled for Dec. 5. We will have the election of club officers followed by a talk by Larry Rudnick of the Department of Astronomy at the University of Minnesota.

Rudnick's past programs have been very enjoyable. His topic at the December meeting is "Was There a Big Bang?"

IMPORTANT!

See voting information under "Election" on page 2.

COMET

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20:30 hours local time, I found the comet.

The comet was examined using a 26mm Meade Series 4000 plossi, which yielded an effective magnification of 92X. The coma was diffuse, with a hint of brightening towards the center of the coma. There was no clear indication of a tail, although there was the slightest hint of a tail to one side of the coma. This was estimated to be less than one arc minute in length.

Visual magnitude was estimated to be about magnitude 6.2, although the sky was filled with smoke from various fires. Many people were burning their leaves, and a few farmers were busy burning off crop residue, making the sky somewhat smokey.

Three stars were visible in the same field of view as the comet,

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which formed a right triangle. The brightest of these stars was in the upper left and was estimated to be magnitude 6.5. The comet was observed for about an hour, at which time it had sunk too low in the western sky to allow for continued observations.

ELECTION

An election will be held at the December meeting. Three positions were open this year. The vice president, treasurer and board member at large positions need to be filled. Dick Nelson, the incumbent in the treasurer's position, is running unopposed this year.

For vice president there are two candidates:

Paul Walker--incumbent
Bob Liensenfeld

For board member we have two also:

Steve Boike--incumbent
Mike Kibat

If you cannot attend the meeting but wish to assert your right to vote, please write what your choices are on a sheet of paper and mail it to Steve Korzenowski. Steve is your current president and his address is printed elsewhere in this publication. Thank you.

ANNOUNCEMENTS

The MAS has received a letter from David Starkka in Brainerd asking for help in building an inexpensive radio telescope. If you have had any experience in this field and would like to help him, has address is: David Starkka, 606 South 8th Street, Brainerd, MN 56401.

Starrka is also president of the North Star Astronomy Club in Brainerd and I have written him about the possibility of holding a joint star party with them sometime next year. If we can find an acceptable site, it would be held somewhere with very dark skies.

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ANNOUNCEMENTS

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We have received a letter from a group in Russia that would like to establish contact with amateur groups in the U.S. that are interested in observing new comets. If you are interested, you can get the address from Max Radloff (451-7680).

The club has received a donation of copies of Sky & Telescope and Astronomy from 1981 to the present. If you are interested in these, please call Max Radloff.

If you need a telescope tube, an 8.5-inch I.D., 56-inch long PVC tube is free for the asking. If you are interested, call Chuck Shane at 699-1274.

The Observer's Handbook published by The Royal Astronomical Society of Canada has arrived and will be available at the December meeting. We also have copies of Guy Ottwell's Astronomical Calendar on order which will be available when they arrive.

Prices are $11 for the Observer's Handbook and $13 for the Astronomical Calendar. If you can't make one of the upcoming meetings and would like a copy mailed to you, call Max Radloff to make arrangements.

There are no more star parties until spring. In addition to our regular Metcalf and Baylor star parties, we would like to have extra ones at other sites. One has been scheduled at the Chase-Ryan observatory in May and there are tentative plans for one at a very dark site up north together with other amateur clubs.

If you have any other ideas or suggestions, call Lauren Nelson or Max Radloff.

Celestron has announced a photo contest. There are eight categories with three prizes--$300, $100 and $50--in each category. Photos must be taken with Celestron equipment. The deadline is April 30, 1990.

If you would like to enter, please call Max Radloff to get a complete set of rules.

The program for the January meeting has not yet been determined so please call our recorded phone message (534-7481) to check on the program and the place. If things go as planned, we will soon have a new phone service so we can have longer messages. We will keep the old number functioning for awhile to refer calls to the new number.

FOR SALE

A sunspot projector built into a box incorporating a 2-inch lens and an eyepiece. A 9.25-inch f/7 mirror (needs recoating). A turntable-type grinding machine. A 2.5-inch f/17 lens. Each item $50. If interested, contact George Ripley at 462-3874.

DEEP SKY EYE

By Max Radloff

It is probably a standard assumption among astronomers that a good photograph will show faint objects better than the eye can see them. Although photographs will normally show objects that are beyond visual observations, it is also true that there are cases where the eye will see more than can be recorded on film.

Walter Scott Houston has often discussed the underestimated abilities of the human eye in seeing faint objects, most recently in the October, 1989, issue of Sky & Telescope. The two faint galaxies I will discuss this month are good examples of the potential of visual observations.

I. 10 and Maffei 1 can both be found in Cassiopeia amid the rich profusion of clusters and nebulae of the Milky Way. If i were not for the obscuring effect of dust clouds of our galaxy, they would be among the brightest galaxies in the sky, but they are dimmed so much that they have become among the most challenging objects for the amateur observer.

Their exact distance has not yet been determined. Some astronomers think that the galaxies are outlying

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DEEP SKY EYE

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members of the local group of galaxies, a little further away than the Andromeda galaxy. More astronomers would place them about three times farther away in a small group between the local group and the M 81 group.

The latter idea not only is supported by more recent research, but also by their placement in the sky. When the galaxies of the local group such as M 31 and M 33 are on the meridian, I. 10 and Maffei 1 are north of the zenith. Lower towards the northeast horizon are the closest members of the M 81 group, I. 342, NGC 1569 and NGC 2403, and even lower are M 81, M 82 and the other members of the M 81 group.

While visual observation of these faint galaxies is possible, it will not be easy. You will need an 8-inch or larger telescope and excellent observing conditions. You will be stretching your telescope and your observing abilities to the limit, so you must have a site free of light pollution, a night free of haze and an eye trained to see very faint objects.

I. 10 was discovered Oct. 8, 1887, by Louis Swift of the Warner Observatory in Rochester, New York, and was described by him as a faint star involved in a very large, extremely extremely faint nebulosity; extremely extremely extremely diffuse.

The triple adjectives speak for themselves. What we now know as I. 10 was the first of a list of 100 new nebulas of which Swift said, "For the most part they are exceeding difficult objects, requiring exquisite seeing, prolonged scrutiny of the field and an eye trained specially for the work."

The position of I. 10 for 2000.0 is R.A. = 0h20.4m and Dec. = +59°18', just over a degree east of Beta Cassiopeia. A finding chart has been provided, since this is a rich area of the Milky Way and it is easy to lose your way among the wealth of faint stars. Remember, that since you will be observing between the zenith and the pole, north will be towards the horizon and in a telescope that inverts the image, north will appear at the top of the field, the same as on the chart.

If you use the finder chart, start by locating the pair of doubles just south of Beta Cassiopeia. You should then be able to find the other stars on the chart and move to the pair west of I. 10. When you look

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DEEP SKY EYE

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in the area marked on the chart, you will see a number of very faint field stars.

If the skies are clear and your eyes are sharp, there will be a very faint diffuse light around them, elongated in an east-west direction. Since groups of faint stars often appear nebulous, to make sure you have really seen the galaxy, find a similar group of stars nearby and compare their appearance with those in front of I. 10.

If the appearance is the same, you have not seen the galaxy, but if the group in the position of I. 10 appears brighter with a diffuse nebulosity, you have been successful. Unfortunately, there are no photographs of I. 10 that are easily accessible. The two pictures of the field of Beta Cassiopeia in Burnham's Celestial Handbook do not show the galaxy and neither does the photo on page 81 of the February, 1989, issue of Astronomy.

I. 10 is classified as in irregular galaxy similar to the Large Magellanic Cloud, with a bar and weak spiral arms. It is about the size of the satellite galaxies of M 31.

Maffei 1 is an object that is both easier to photograph and to see. Curiously, it was discovered only in 1967. The Italian astronomer Paolo Maffei was photographing the I. 1805-i. 1848 region, which is filled with complexes of emission nebulae when he noticed two faint smudges that, after further research, turned out to be highly obscured galaxies.

Maffei includes the story of discovery in his excellent book, "Beyond the Moon."

Because it shows only faintly on photographs, Maffei 1 was considered beyond visual observation, but about four years ago a sighting in a 17.5-inch telescope was reported. Soon after, just out of curiosity, I decided to examine the area with my 10-inch scope and was startled to see a faint but unmistakable nebulous glow.

Soon after my observation, I heard of other sightings in small scopes. My most recent observation, on Oct. 7 in exceptionally clear skies, showed an elliptical glow, gradually brighter to the center spread over an area three or four times larger than that shown in the Palomar photograph in Maffei's book.

You can use the finder chart to star hop to Maffei 1 from the Double Cluster or set your telescope to R.A. = 2h36.3m, Dec. = 59°39'. There is a little knot of 12th magnitude stars in front of the galaxy, but when conditions are favorable, the glow of the galaxy extends well beyond them.

Maffei 1 is no more difficult than the Cocoon nebula or NGC 147, although if you have observed these objects you know that they are not easy. There is a photograph that includes Maffei 1 on page 249 of the March, 1989, Sky & Telescope. It shows the nucleus of the galaxy in the knot of stars mentioned above but it shows only a hit of the glow that can be seen visually, extending well beyond the knot of stars.

If you spot Maffei 1 your eyes have seen something that did not register on the Palomar Sky Survey blue plates taken with a 48-inch Schmidt camera. It sounds fantastic, but there are cases where the human eye can outperform advanced photographic techniques.

Good luck and clear skies.

WILDERNESS STAR PARTY

From Bill Walter

Attention deep sky enthusiasts. I am trying to organize a star party to be held in northeastern Minnesota near or in the Boundary Waters Canoe Area. The idea is to set up telescopes in on the ice near one of the lodges.

This would give us a place to stay and a completely unobstructed horizon for viewing. For example, Windigo Lodge on Poplar Lake would be a good place. It is located along the Gunflint Trail some 30 miles as the crow flies form the nearest town, Grand Marais (population about 1,200).

it is also more than 70 miles from Thunder Bay and 120 miles from **(Continued on page 6)**

WILDERNESS STAR PARTY

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Duluth. It's elevation is about 1,200 feet above the small towns along Lake Superior.

There are thousands of miles of wilderness to the north and east and 40 miles to the south before you reach 100 miles of open water. You get the idea; the sky is very dark.

Last February I was able to seethe zodiacal light extend about 60 degrees above the horizon. They also have rooms for as little as $35 per night double occupancy.

Possible dates would be Jan. 26 and 27, Feb. 23 and 24 or March 23 and 24. Anyone interested should contact Bill Walter evenings at 612-452-4438.

ELECTED POSITIONS:

ACTING PRESIDENT
Steve Korzenowski
1614 Welcome Ave. N.
Golden Valley, MN 55422
Phone: 544-8335

VICE PRESIDENT
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SECRETARY
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St. Paul, MN 55116
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BOARD MEMBERS AT LARGE
Don Day
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Phone: 488-1279

Steve Boike
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Arden Hills, MN 55112
Shoreview, MN 55126
Phone: 633-3254

SEEING DOUBLE

By Bob Liesenfeld

As several members of MAS know, my observing passion is double stars, so I thought I would pass along some information about this relatively neglected field. The first parts of this series will deal with some of the historical aspects and later editions will address observing and measurements.

Before the middle of the 18th century, the idea of double or multiple stars had been discussed but no evidence of their existence had come to light; however, about 1776, William Herschel was about to provide this evidence, albeit unknowingly. Herschel was one of the greatest astronomers of all time and had a large impact on the science; however, he did have a few rather odd ideas. For example, Herschel was firmly convinced that the interior of the Sun was inhabited by intelligent creatures!

Another interesting story concerns his efforts to construct ever larger mirrors for his telescopes, in this case a 36-inch. At this time the art of glass making had not progressed to the point where large blanks could be successfully cast, so mirrors were made of what was known as speculum metal.

Herschel gathered together, as his sister and observatory assistant Caroline called it, "an enormous quantity of horse dung" to make a mold for this, the largest mirror of its day. The mold was constructed in the basement of the Herschel residence and the alloy for the objective was placed in the mold and heated.

All went well at first but as the metal became molten the mold cracked and began to leak molten material out onto the floor. Suddenly, the flagstones making up the floor started to explode from the heat, sending William, Caroline and the workmen running for their lives!

After this harrowing experience, Herschel left the foundry work to professionals. Armed with some of his giant reflectors, he set out on **(Continued on page 7)**

SEEING DOUBLE

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a project to measure the distance to some of the stars.

He planned to do this by making very careful measurements of the position of a star relative to a nearby neighbor, then taking similar readings on the same stars when the Earth was on the other side of its orbit around the Sun.

Herschel hoped to see a shift in the position of one star compared to its neighbor. You can easily demonstrate this principle by holding a finger up at arm's length, close one eye, line up your finger with a distant object and note how the distant object appears to shift relative to your finger when you open the other eye.

Herschel correctly reasoned that by observing the same star when the Earth was first on one side of its orbit and then on the other side, it would be possible to see this same shift. Armed with this shift, or "parallax," it would be possible to compute the distance to a given star using simple geometry.

He knew that he must make exceedingly careful measures of many stars to eliminate errors. Over a period of many years Herschel made such measurements. After much hard work it became clear that this method was not going to yield the distance to a star with the equipment at his disposal.

He did, however, notice that some of the stars that he measured had shifted but not in the directions that he had expected. He reasoned that the cause of this motion was due to the fact that the two stars were in orbit about their common center of gravity, thus a double or binary star.

The announcement of his findings in about 1800 was not immediately accepted by all astronomers of his day but as time went by, and the data built up, it became apparent that Herschel was correct.

Thus began the study of double stars.

Next time we will take a brief look at a few of the other famous names in this field, some of whom were, like Herschel, "only amateurs."

THE VOICE IN THE WILDERNESS

By Harold Doweiko

Every since I purchased my Meade 10-inch Schmidt-Cassegrain my old telescope has sat unused in a corner of the garage. True, the old scope was only three years old this past spring but the greater light-gathering power of the 10-inch Schmidt-Cassegrain seemed to make my older 8-inch Schmidt-Cassegrain unnecessary.

So I decided to put it up for sale. In the process, I learned several lessons.

The first step that I decided upon was to place an advertisement in Astronomy. I sent a letter providing a description of the telescope and the accessories that were to be sold, along with my <u>firm</u> price of $1,000 plus shipping. This price seemed fair for the field tripod,

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<u>NON-ELECTED POSITIONS:</u>

<u>PROGRAM DIRECTOR</u>
Lauren Nelson
787 Clayland St.
St. Paul, MN 55104
Phone: 644-1254

<u>CLUB LIBRARIAN</u>
Michael Granlund
4719 Dupont Ave. N.
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Phone: 529-7341

<u>STUDENT REPRESENTATIVE</u>
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1326 Charles Ave.
St. Paul, MN 55184.
Phone: 646-8138.

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telescope, dew cap, 9 mm and 25 mm eyepieces, 8 X 50 finder scope, R.A. motor control and 35mm camera mount.

After a wait of several months, the advertisement appeared in the Reader's Exchange section of Astronomy. A few days later, the first telephone inquiry occurred. The caller, who claimed to be from a town in Canada that wa so small that I could not find in on my National Geographic maps, told me to "consider the telescope sold" and promised a check would be in my mailbox before the end of the week.

The month came and went. No check made its appearance in my mailbox.

To be on the safe side, I had decided upon a policy that the first person whose check cleared the bank would own the telescope. So I continued to accept calls about the telescope. The next caller, who was from California, can hardly be called a "serious" caller, however.

He began the conversation by asking if I were the "dude" who had "the bit about the telescope in that magazine." He asked me how much I was willing to take for the telescope. I informed him that the price was as quoted in the advertisement: $1,000 plus shipping. The caller seemed irate that I was not willing to bargain over the price and offered a rather pointed suggestion as to where I could store the telescope. (He didn't mention if this suggestion included the dew cap or not.)

There was one gentleman who called several times from Texas about the telescope. After talking with him, we agreed that he would send a check to cover the shipment of the telescope and that I would send the telescope Cash on Delivery (COD).

This latter point was necessary because I did not want to let somebody actually have the telescope until I had the cash in hand. Shipping the telescope COD would not leave the buyer wondering if he would actually get a telescope for all that money, as he would not part company with his hard earned cash until he had the telescope.

I called on of those "when you absolutely have to have it there overnight" shipping companies and asked them if it was possible to ship a telescope that weighed 100 pounds from Austin, Minnesota, to Houston, Texas. I was told that there would be "no problem." I also asked how much it would cost to insure the entire package against damage and whether it would be possible to ship it COD.

There was, I was assured, no problem. We ship everywhere on the planet, I was told and some places that are not on this planet. They would collect the $1,000 from the person who received the telescope and I would eventually receive the money from the shipping company.

This process would take about a week, according to the nice lady on the telephone who answered my questions, and did not require any special paperwork because they shipped things COD all the time.

I then spent the better part of a weekend crawling around in the attic, looking for the shipping cartons that the blasted thing came in when I purchased it. I parked the telescope, dew cap and assorted accessories for their journey and brought the whole lot down to the local office of my friendly overnight shipper.

After weighing each of the three boxes, making sure they were sealed property and the address was on the proper part of the box, I paid the fee for shipment. As you young man hoised the telescope onto a cart, he asked if there was any glass in any of the boxes.

I asked what difference that would make, as it was all neatly packed for shipping and was insured. "We don't insure glass," was the answer. "We have had problems with glass breaking, especially curved glass."

Wonderful! Apparently the nice lady who answered my questions on the telephone was unaware of the fact that a telescope is about 90 percent glass, curved glass at that, held together with a little bit of metal and plastic. Here I am with an eager young buyer 1,800 miles away, the

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VOICE IN THE WILDERNESS

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telescope all packed and ready to go, only to discover that if either of the mirrors or the corrector plate broke, I might end up with an 8-inch flower pot complete with setting circles and motor drive.

So I sent the guy his check and explained that it would not be possible to complete the sale. Having two telescopes i snot such a bad thing. That 10-inch Schmidt-Cassegrain is pretty big and heavy, which makes the 8-inch scope that much more attractive when it comes to hauling it across the state to a star party.

Besides, it is easier to adjust the latitude on the 8-inch Schmidt and it is easier to mount my camera on the top and...

AN EVENING WITH THE STARS

By Walter Hayes

"See the stars come out along with the planets and other fascinating celestial bodies. Eagan Parks and Recreation will be sponsoring a star gazing night to help us better understand and enjoy the autumn evening sky...".

This announcement appeared in the Eagan News, publication under its Parks and Recreation Fall Programs and I was fortunate to be the one asked to organize this activity.

Early this spring I had requested an after-closing permit from the Eagan Parks and Recreation Department. This permit would enable myself and my friend Steve Ready to use the Thomas Lake Park Recreation Area for star gazing after the 11 p.m. closing time.

In August, I received a call from John Dyanagi, the Parks Recreation Supervisor. He stated that he had obtained my name as a result of that permit request. He then explained Eagan's proposed star party and asked if I could help him organize it. I agreed and, thus, the lead paragraph for this story became a reality and eventually a success.

On Oct. 3 we had a beautiful clear sky; John told me they had tried this before but this was the first time the weather had cooperated. Out of a total registration of 72 participants, 40 or 50 actually showed up; I had expected maybe 10 or 15 to register. Ha! Some who came brought binoculars, some brought star charts and a couple even brought their own telescopes.

I had a great time and, thanks to those who donated their time and equipment, I think everyone else did too.

Initially I wa able tot line up three telescopes for viewing. My two telescopes consists of a 4-inch Meade Schmidt-Cassegrain and a Celestron SPC-8.

I asked my friend Steve Ready if he would help out, and he agreed to bring along his 10-inch Meade LX5. A week before the closing for pre-registration for the event, John Oyanagi again called and told me that so far 50 persons had registered.

I was amazed and knew that three telescopes would not be enough. I then asked Joe Damiani of Rosemount if he could help. I had met him at the Sept. 1 MAS star party and had mentioned the event to him at that time. He agreed and was able to bring along his Celestron SPC-8.

What did we see! Well...the event was scheduled to start at 7 p.m., too early! Right! Yes it was, but the moon was visible as a slight crescent and Venus was up also. Saturn showed shortly after 7:30 p.m. and awed everyone.

When the sky darkened sufficiently, we then gave everyone views of the Double Cluster in Perseus, M 31 in Andromeda, M 15 in Pegasus, M 13 in Hercules and a new one to me and a favorite for those who saw it, the E.T. cluster in Cassiopeia (NGC 457).

My biggest surprise was seeing my father for the first time in years. He drove here from St. Louis just for this event. (Maybe next time we can call it the National Eagan Star Party.)

The cold weather caused people to start drifting away between 8:30 and 9 p.m. and by 9:30 p.m. the Eagan Star Party had ended.

Already John Oyanagi is planning another for next spring, a new sky

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EVENING WITH THE STARS

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with more fascinating objects to see. I hope he contacts me again and maybe other MAS members will be willing to share their time and telescopes. (Four telescopes for 50 or more people just ain't enough.)

There seems to be more public interest in amateur astronomy than I had believed but people are nut sure how to get started and are a little bit uncertain about buying a telescope. I am certain many of the people who came to the Eagan Star Party probably had or have one of those rather expensive, for what you get, 600X, wobbly, small-aperture, ruin anybody's excitement imports that Target or Sears might sell. (I did.)

I am certain that is why so many people showed, to find out if that is really all there is for amateurs. I think that John, Steve, Joe and myself helped open some eyes and, maybe, rekindle that excitement in more than a few of them. I hope that

GEMINI
c/o Richard Goggin
1326 Charles Ave.
St. Paul, MN 55104

come next spring some of them will return to the Eagan Star Party with their own scopes and a brand new excitement to pass on.

AT THE PLANETARIUM

The Minneapolis Planetarium is offering the following programs:

-- "The Story of the Star" runs Nov. 11 through Jan. 14 at 11 a.m. 1:30 p.m. and 3 p.m. Saturdays, 1:30 and 3 p.m. Sundays and 7:30 p.m. Thursday evenings. There will be additional shows at 11 a.m. and 1:30 p.m. on Dec. 20-22 and 26-29.

-- "The Universe Game" runs Oct. 13 through March 24 at 7:30 p.m. Friday and Saturday evenings.

-- "Max's Flying Saucer" starts Jan. 20 and runs through March 25 at the same times as "The Story of a Star."

Call 372-6644 for more information.

Space prohibited including a report on particle physics from Bill Larson. See the next edition.