

+++ January 1997 +++

This Months **KAS** Events

General Meeting: Wednesday, January 8, 7:00 p.m.

Meet At Kalamazoo Area Math & Science Center

Board Meeting: Tuesday, January 14, 7:00 p.m.

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1996
Year
In
Review

Prime Focus

A publication of the Kalamazoo Astronomical Society



December Meeting Minutes

The General Meeting of the Kalamazoo Astronomical Society kicked off at 7:10 pm on Wednesday, December 4th, 1996 at the Kalamazoo Valley Museum in the Universe Theater and Planetarium with a short introduction by John Kirchhoff to the wonder and enjoyment of amateur astronomy. His description of astronomy as being a "subtle and gentle hobby" could very well be the underlying foundation to the Kalamazoo Astronomical Society. After John's talk, several members of the Society gave short presentations on "Great Gifts for the Amateur Astronomer." These included Bill Nigg, Richard Bell, Mike Dupuis, Pete Mumbower, Mark Miller, and Dave Garten. Then all visitors and members were invited to view examples of great gifts in the lobby of the Universe Theater and Planetarium. Refreshments were also available throughout this portion of the meeting.

After viewing the wonderful variety of great gift ideas, talking to members about their equipment and gear, and collecting the enormous number of catalogs available (very special thanks to John Kirchhoff for providing all the Meade and Celestron catalogs), the Society reconvened in the Planetarium for the business portion of the meeting. This included nominations and election of officers for 1997. The officers for the next year are:

President: Mike Sinclair
 Vice president: Dave Moore
 ALCOR/Secretary: Mike Dupuis
 Treasurer: Bill Nigg
 Newsletter Editor: Richard Bell
 Members-At-Large: Mark Miller and Dave Garten

While votes were being counted Richard Bell ran a short demonstration program using the Digistar Projector. Members were allowed to interact during the show by choosing one of three "rides". Richard gave the good advice to chose the "Mobius Strip" and it was very exciting. After the meeting some members reported they were forced to turn away due to the dizzying effects. WOW!

Upcoming astronomical news was discussed next as well as a reminder of the KAS Observing Session at Astropad on December 13/14. Members were informed that the next General Meeting of the Kalamazoo Astronomical Society will be held at the Kalamazoo Area Mathematics & Science Center at Old Central High School on Wednesday, January 8, 1997 beginning at 7:00 pm (see map on the back of this newsletter). Richard Bell received a 1997 Astronomical Desk Calendar as a gift for his outstanding work on the past years' newsletters. The meeting was "gaveled" to a close at 8:55 pm.

December Meeting Minutes submitted by: Mike Sinclair



Board Meeting Minutes

The meeting began at 7:30 p.m. with a round of congratulations for everyone's hard work throughout the year. The members present then got a chance to look at some other newsletters that also carry the name "Prime Focus". Needless to say, ours outdid them all by a wide margin -- way to go Richard Bell!!

The next thing we discussed is the progress of the club's observatory at the Nature Center. The footings for the building are in, the pier is poured, and the forms for a few of the walls have been completed. Work has been suspended until the spring, at which time the observatory should be up in a few weeks.

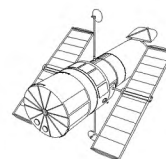
The balance in the club treasury as of mid-November was \$1191.00 or very close to it. Membership dues for 1997 and the ticket purchases from the MSU field trip had not been added in yet. After this update, we touched on ways to increase our profile in the community via newspaper, television, radio, short wave, long wave, seismic wave, etc. You get the picture.

Our burgeoning Hale-Bopp strategy was discussed; where should we meet, how to motivate people to get up early in the winter mornings to see it, how bright will it be? If anyone would like to help or has suggestions, let one of the officers know about it!! That is the only way the club will be better next year -- if everyone will contribute what they can in ideas, time volunteered, etc.

Club members will get to choose their observing guide this year. Pick either the one from Astronomy or Sky & Telescope. We will order 20 of each and one will be available for each membership paid. Bill Nigg mentioned that if you already have one, then donate your club copy to a local school or library to foster interest and maybe generate new members.

Other things we touched on: Club discounts from Sky & Telescope and Astronomy, upcoming programs for general meetings, Starfest '96 and the recent mirror workshop on video (see Bill Nigg), Astronomy Day 1997 (4/12/97), and making a "checklist" for new users who would like to borrow the club telescopes. One last note to mention is that the January meeting will be at KAMSC on 1/8/97 -- this is a change in location for the January meeting. Hope to see you there!! Meeting was adjourned at approximately 9:00 pm.

Board Meeting Minutes submitted by: Mike Dupuis





The President's View

by Michael Sinclair

It has been a long, sometimes difficult, but ultimately productive year. In many ways, it has been an especially bountiful year for us. Although we experienced a dramatic drop in membership at the beginning of the year, in the last six months we have seen an encouraging increase in the number of new and returning members of the Kalamazoo Astronomical Society. The Society is nearly sixty members strong now. With the arrival of Hale-Bopp in March, another (93% total) lunar eclipse, and Mars at opposition, I foresee even more members joining in the enjoyment and excitement of amateur astronomy.

Comet Hyakutake made a brief but incredibly exciting appearance last spring, and sparked a great deal of enthusiasm and some pretty fair publicity from the local media (including the Kalamazoo Gazette and WWMT Channel 3). I sincerely hope to see even more excitement and publicity for the Society when Comet Hale-Bopp swings by in March and April.

We did have our difficulties over the past year. There was a great deal of internal turmoil on the Board but that appears to have been permanently solved. I am especially looking forward to working with the new Board this year and am expecting great things out of each member. The newsletter has become one of the best in the nation and has received rave reviews from many sources (including, as noted in this column earlier in the year, an astronomy news group in Hawaii). Richard Bell deserves a great deal of thanks and continued support for his outstanding efforts. Rich has been more than willing to make changes to the newsletter, work with members to bring you informative and up-to-date articles and news items, and has always been more than willing to accept articles from any and all members. However, the newsletter lives and dies by its contributors. Even though I have personally asked several members to write articles, I have not always been able to get them to write them. As a result, there have been occasions where newsworthy events were never reported to the newsletter and that can only be the fault of those who have been asked to contribute. So if you're asked to write an article, provide a photograph, or just submit a short note, please follow through and do your part to promote our Society through our newsletter.

We have finally started work on the Kalamazoo Nature Center Observatory. There has been a great deal of hard work, consistent effort, and a strong desire to complete this project at a minimal cost to both the Nature Center and the Astronomical Society. Special thanks must

go to Dave Moore, Bill Nigg, and especially Dave Garten for their efforts in advancing the project and doing the dirty work in getting the concrete pier poured before winter set in. This spring, we expect to complete the Observatory. We'll need the manpower support of our members for that, so watch for a "call to action" in one of the upcoming spring newsletters.

We also returned to the Kalamazoo Valley Museum's Universe Theater and Planetarium for several of our meetings this fall. I am looking forward to more meetings at this easily accessible location and if you have not had a chance to visit the Museum, I invite and encourage you to take the opportunity to wander around the Museum prior to a meeting. It is an incredibly fascinating and magical place to visit, and I fully expect our future will always include the Museum as one of the cornerstones of our Society's success.

This year, I hope the Kalamazoo Astronomical Society can accomplish several key objectives. First, I would like to formulate a consistent schedule of meeting sites between the Kalamazoo Valley Museum, the Kalamazoo Area Mathematics & Science Center, and the Kalamazoo Nature Center. Secondly, I would like to ensure that there is at least one scheduled members-only observing session for each and every month of the year. Thirdly, I would like to see the Society continue to grow; I am convinced that we can easily have a base of membership of over a hundred. Finally, I would like to develop a fund raising event which will allow the Society to purchase a good-quality, easily portable Schmidt-Cassegrain telescope for members' use. These are entirely reasonable goals and, I believe, easily attainable if we are all willing to contribute positively to them. If you have any additional ideas of objectives that we, as the Society, should strive to achieve, please feel free to talk with any member of the Board. I promise that your contributions will be both greatly appreciated and seriously considered as we work our way through the next year.

May your nights be dark and your eyes clear!





Vice President's 1996 Year in Review

by Dave Moore

Well, it's almost over. 1996 was a great year to be involved with astronomy and with the KAS. When I was asked to write this article, I first thought that it would be a tough assignment to try to remember all that had happened for a whole year. But as I started going through month by month, it became easy to remember all of the fun and interesting happenings we have been a part of this year.

The year started with the election of a new set of officers for the KAS. I was fortunate enough to have been elected as Vice President. My goal as VP for the year was to get the Nature Center observatory actually underway. The board also wanted to make sure that we had more observing scheduled for the club this year. Both of those items happened and we will build (pun intended) on what we have already in 1997.

In January the KAS started meeting at the Kalamazoo Area Math and Science Center. This proved to be a great place to hold our meetings. We were all treated to large scale images on the KAMSC big viewing screen. The Hubble Space Telescope Science Institute released the most dramatic image most of us could ever imagine seeing with our own eyes. They had turned the Hubble toward any "empty" patch of sky in Ursa Major and just left the shutter open. What they obtained was an image filled with hundreds of galaxies. What a discovery!!

In February, the new Kalamazoo Valley Museum opened and along with it, a Digistar planetarium. Now, a whole new generation of Kalamazoo youth will be exposed to the wonders of the night skies. Comet Hyakutake began its close approach to earth and became an identifiable object. This was looking promising. We had the first annual KAS freeze out, and we did freeze! My LX200 grunted and groaned the whole night, but we had a great turnout and all had fun.

March was a month of lost and found. Comet Hyakutake was found in the evening sky. It became brighter and larger than any of us had ever even hoped it would. KAS members were featured on the local news, KAS member photos were published. What a great experience!! Our annual Messier Marathon ended up being a comet watching party, and the same thing could happen again in 1997, with Hale-Bopp coming in almost one year to the date of Hyakutake.

In April, there was a total lunar eclipse that we all got a good view of at the Nature Center. Astronomy day brought the club together at the new planetarium. Mike Sinclair and Eric Schreur were presented the prestigious Hans Baldauf Award by the Astronomical League. They received their award at a ceremony attended by hundreds of people at the NIAGfest/Greatcon star party. At that same event, club member Tom Taylor received numerous regional awards for the astrophotos he had entered in the contest.

In the months of May, June and July we had more observing at the Nature Center and plans for the observatory were underway. On a personal note, I completed (with the help of some club members) my own

roll-off roof observatory. It was dedicated in June as "ASTROPAD".

In August we had our annual KAS picnic and several members of the club went to Starfest in Canada. The skies were perfect every night and the weather was beautiful during the day. Many interesting talks and presentations were made.

In September a few members went to Astrofest in Illinois. The total lunar eclipse visible in southwest Michigan only with the new Lumicon Cloud Filter. Unfortunately, the cost of a single filter is \$43,525.00 and no club member owns one. The KAS rekindled its relationship with the Kalamazoo Valley Museum and we started to hold general meetings in the planetarium again.

In October, we had our annual astrophotography contest. There were more entries than ever this year and the visitors in the museum were very impressed with our abilities. The final plans for the Nature Center observatory were given to the Nature Center for approval.

November found the KAS hosting a mirror grinding demonstration at the museum and a group of members went to the MSU planetarium for a tour. And, finally, construction of the Nature Center observatory began. Special thanks to Dave Garten for coordinating the early construction efforts.

In December, the 1997 board members were elected during the general meeting at the museum. By all accounts, this meeting was a fun, uplifting way to the end of the year for the club (being as the planned observing sessions at ASTROPAD were clouded out).

Along with the start of construction of our own permanent observatory, the club advanced in two other areas: Under the careful guidance of Rich Bell, our newsletter grew to a big, colorful, informational and entertaining monthly publication. Thanks to all of our club members and their willingness to educate and share their experiences, our membership has grown to over sixty members for the first time in a long time.

Looking ahead to 1997, I see all kinds of opportunities for the KAS and its members. Comet Hale-Bopp will start the year out right for our public observing schedule. We are going to try to hold very special, community-oriented events in conjunction with this visitor from the outer reaches of our solar system. There will be many more club observing sessions scheduled this year. We will finish construction and dedicate our observatory early in the year. I will propose that the KAS makes a concerted effort this year to become more widely known in the Kalamazoo/Battle Creek/Grand Rapids area. I will also propose that we begin a fund raiser early in the year to purchase an 8" Schmidt-Cassegrain Telescope for the club so that many more people can become active with observing (and maybe even photographing) the night skies that bind us all together in kinship. I can't wait to be a part of the upcoming year of fun and wonderment that is sure to be.



Editorial: Year of the Newsletter

by Richard Bell

Year of the Comet! That's what astronomers will say when they look back to 1996. When I look back to 1996 I will think of the great comet Hyakutake. I will also think of the first year I served as an officer in the Kalamazoo Astronomical Society. For me 1996 will be "Year of the Newsletter" because it seems like that's all I did this year - work on the newsletter.

If you would have asked if I would serve as an officer when I first joined the club I would have said: "No way. I hate politics and being a KAS Officer seems a bit to political for me". That all changed in August 1995. The Editor, Pete Mumbower, had a computer crash and lost the September 1995 issue of *Prime Focus*. I volunteered to redo the issue on my computer. If you have it handy pull it out of your archives and take a look at it. It really sucks! Granted, we didn't have much time to work on it, but nevertheless, it stinks big time. When we completed the layout of the newsletter, Pete went home and I looked over what we did. I thought to myself "Boy, I know I can do a lot better than this". So I decided to look at every newsletter I could get my hands on. I looked at other astronomy club newsletters and community newsletters and read literature on how to put a newsletter together and started to design my own. I went through many types of cover formats and finally created one that I'll describe as "revolutionary". For our type of club, I believe it is the best possible cover you can have. Everything you need is right there, where to meet and when to meet.

Besides having a nifty cover, I wanted the newsletter to be more than just news about the club. I wanted to put in articles that were relevant to the time of year and for whatever type of program we were having at the general meetings. For example, in the March issue I put in an observing list for the Messier Marathon and in the May issue I put in an article about building a gadget, since the May meeting was "Gadget Night". I also wanted to put in current news from NASA like the Galileo mission to Jupiter and what the Hubble Space Telescope was up to. Putting in projects like calculating the phases of the Moon and charting the Moons of Jupiter were also important in my opinion. Not to mention having nice pictures. If you ever plan on doing a newsletter I have two words for you...Clip Art! You can never have enough of it. But what I really wanted was original articles from the membership. I may not of gotten as many as I had hoped for, but I did get some. Even though I had to pester everyone for them!

Now let me make it clear that I worked on a new type of newsletter, but still wasn't sure if I would run as Editor. If Pete wanted to run again I would have stepped aside. I think, under the circumstances he was forced to endure, he did a great job on the newsletter. It was a

major source of inspiration for me. He made me bring the newsletter to a new level. Of course, Pete decided not to run as Editor again, so I decided to go for it. I remember mailing my first issue and I was a bit worried that it would get lost in the mail. As far as I know every issue made it to its destination and the response to it was 99.9% positive. I did get a few suggestions like change the font, which I did. I also got comments on the full page format. A very small minority wanted to go back to the booklet format. Eventually the club voted on what format was best and it was a slaughter! Let me make one more thing clear, no matter what happened I would have stayed with the full page format. I worked very hard on that style and I felt it was the best one. To my knowledge, no one has ever told the Editor what style of newsletter to do and it wasn't going to start with me. Of course, most people liked the full page format and through the course of the year I put out the best newsletters any astronomy club has ever seen.

You may ask: "Why is the newsletter so important to you?" I believe the newsletter is what people use to make their first judgment on a club. I think the KAS is a great club with great people and I wanted the newsletter to reflect that. I also wanted the newsletter to show how much I care about astronomy. Not to mention that 1996 was the 60th anniversary of the KAS and I wanted to do something special. Oh yeah, I'm also a bit of a perfectionist!

Now for some "technical" stuff. If you've wondered what I use to put the newsletter together then read on. The computer I use is a Power Macintosh Performa 6200CD. The software I use is ClarisWorks 4.0, but I also use a GIF converter (graphics program). The printer I use is a Epson Stylus Color, which belongs to Pete Mumbower. If you want to thank someone for the nice covers I make, thank Pete. He's been very generous for allowing me to use his printer over and over again. I would also like to thank Mike Dupuis, Michele McLaughlin, Mark Miller, Bill Nigg, Eric Schreur, and Mike Sinclair for their contributions to *Prime Focus*.

I look forward to putting out more great issues of *Prime Focus* in 1997. I have big plans for a "super issue" in March, since a "super comet" will be making its long awaited visit to the inner solar system. I'm going to need a lot of help with that one. Please call me if you'd like to get involved.

I'm looking forward to working on all the other projects that will come up in 1997. It should be another memorable year with the close approach of Comet Hale-Bopp, the completion of the KAS Observatory at the Kalamazoo Nature Center, and meeting new people who share an interest in astronomy. Good Stargazing!!!

Treasurer's 1996 Review

by Bill Nigg

The recent year was really highlighted by observations of a close comet and lunar eclipse. But down here on Earth our fellow club members also accomplished a lot. Starting our observatory building at the Kalamazoo Nature Center and impressive photos from Astropad, many excellent meeting topics and several observing sessions are right on target to benefit all members.

Improvements in community support from the Kalamazoo Valley Museum Planetarium, Kalamazoo Nature Center, Rider's Hobby Shop, and the Kalamazoo Area Mathematics and Science Center. Top quality newsletter added to good attendance at a variety of events. New members asking good questions prompted many educational sessions. All the results of many man-hours of semi-fun work by the KAS Board Members. It also looks like it will continue!

The board meetings did suffer through some frustrating times from one difficult member and resulted in a rejection vote. The opportunity is always available for anyone to help the club - voting someone into office should not be for popularity or "let Sam do it" negligence. Careful consideration for representation and leadership gives bet results.

The KAS goal is education in Astronomy - how much fun can the members have while we do this? Suggestions, contributions, questions, complaints, and volunteers are always welcome. "Have we ever tried...?". "Why don't we...?". Nobody knows everything - everybody knows something. Call up your fellow members and ask!

I have made a list of items to propose in the clubs future - some may take a while and some may be changed. I invite discussion on these and similar topics for board action.

- (#1) Respond to all member inputs.
- (#2) Welcome and support beginners - advanced activity is for inspiration only, make sure shy people are fully included.
- (#3) Continued support of the newsletter and all communications.
- (#4) Assist Dave Garten with observatory construction.
- (#5) Create an annual club information publication.
- (#6) Variety of enriching and entertaining meeting presentations.
- (#7) Constitution and bylaws refinements.

This list is general and constantly evolving - more to come.

Hopefully each club member can look back last year and can show improvements in their astronomy education and experience. Next year you will need that for a new comet, the opposition of Mars, another lunar eclipse, and for observing many new space objects.



NOTES FROM MIKE THE ALCOR GUY

by Mike Dupuis

This is my year in review for all the members, or what have I done for you lately column. I believe that the ALCOR position is one of the easier roles to fill in the club. My main task is to make the membership aware of the variety of programs and materials that are available through the Astronomical League. I have written a few columns outlining the services available and have run two columns on the various observing programs and awards. Now all that's left to do is wait for requests and keep reminding you about what is available. We all pay dues to the League and I hope we as a club can get something out of it besides "The Reflector."

The nice thing about the awards is that they give us something to focus on when we turn our telescopes to the heavens. Whether it is double stars, galaxies, planets or meteors, there is a program for everyone. If you would like to dream up program, then I will help you get the ball rolling. The other thing that I hope to do in my semi-frequent column is to encourage everyone to get out and look up!! There is a lifetime of observing to do for everyone, no matter how young or old. Many times I go out just to familiarize myself, my family and my neighbors with the seasonal constellations. This gives me a better appreciation when I go out later and use my telescope. If you need any information on any of the programs, give me a call and I hope to hear about what you have been looking at!!

Member-At-Large Report

by Dave Garten

At last, after four years of waiting we finally got the go ahead to break ground for the KAS observatory at the Kalamazoo Nature Center. I didn't waste any time in getting over there. Bill Nigg all ready marked the area out for the observatory. When I got there I met Don Hanilton, Randy Gray and Al. (sorry Al I never did catch your last name.)

We were ready to go or at least I was. Al said he would be out there with the bobcat right after lunch. The next day Al said he felt kind of bad, here's a guy waiting four years to build this and I put him off for lunch. I told him not to worry about it, waiting one more hour after four years was no big deal.

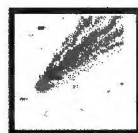
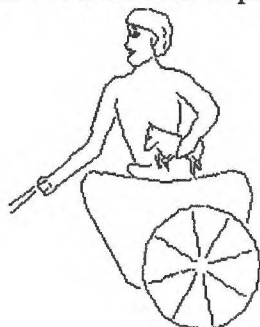
Well we got the hole dug and Don did a great job in building the forms for pouring the concrete. The pier is poured and footings for the pit wall. The wall needs to be poured. I was wanting to pour the wall this year "96" but winter came a little early.

So we are on hold for now until spring. It won't take but one day to pour the wall. Then we have to pour the floor. That is going to be a fairly big job and we are going to need a lot of help.



HIGHLIGHTS OF THE JANUARY SKY

- 1 Earth is at perihelion (147.1 million kilometers from the Sun), 7 p.m.
Mercury is in inferior conjunction, 8 p.m.
Last quarter Moon is at 8:45 p.m.
- 3 **Quadrantid meteor shower peaks**
- 7 The Moon passes 5° north of Venus, noon
- 8 New Moon is at 11:26 p.m.
- 10 The Moon is at perigee (359,233 kilometers from Earth), 3:50 a.m.
- 12 Mercury passes 3° north of Venus, 9 a.m.
- 13 The Moon passes 2° north of Saturn, midnight
- 14 Asteroid Ceres is in conjunction with the Sun
- 15 First quarter Moon is at 3:02 p.m.
- 17 Neptune is in conjunction with the Sun, 8 a.m.
- 19 The Moon passes 0.7° north of Aldebaran, 1 a.m.
Jupiter is in conjunction with the Sun, 8 a.m.
- 23 Full Moon is at 10:11 a.m.
Mercury is at greatest western elongation (25°), midnight
- 24 Uranus is in conjunction with the Sun, 9 a.m.
- 25 The Moon is at apogee (406,224 kilometers from Earth), 11:45 a.m.
- 28 The Moon passes 3° south of Mars, 6 p.m.
Mars is at aphelion (249.2 million kilometers from the Sun)
- 31 Last quarter Moon is at 2:40 p.m.



COMET COMMENTS FOR JANUARY

Comet Hale-Bopp passes north of the sun and into the morning sky on Dec. 31. Observers with a low eastern horizon should be able to pick it up again by the third week of January.

In the past few weeks stories of "mysterious" objects in the vicinity of the comet have circulated. The most popular-a Saturn-like Object (SLO) imaged on Nov. 14 by an amateur astronomer- turned out to be nothing other than an 8.5 magnitude star. Other similar objects that I've seen on Internet images appear to be out-of-focus images of bright stars. In all respects Comet Hale-Bopp is behaving as an average comet. It is bigger than perhaps any comet we have seen, but its variable brightness, tails and jets are normal. If anything mysterious truly appears, you will find it reported in the mainstream press, and in most cases be able to go outside and see it yourself through your telescope.

Meanwhile, Comet Tabur dims in our morning sky. Its magnitude has been unpredictable lately.

EPHEMERIDES

C/1995 O1 (Hale-Bopp)

Date(00UT)	RA(2000)	Dec.	El.	Sky	Mag.
12/28	18h 36.7m	+03° 51'	27°	E	3.1
01/02	18h 44.0m	+05° 01'	28°	M	2.9
01/07	18h 51.7m	+06° 18'	29°	M	2.7
01/12	19h 00.0m	+07° 45'	31°	M	2.5
01/17	19h 08.9m	+09° 22'	32°	M	2.2
01/22	19h 18.5m	+11° 11'	34°	M	1.9
01/27	19h 29.0m	+13° 13'	36°	M	1.7

C/1996 Q1 (Tabur)

Date(00UT)	RA(2000)	Dec.	El.	Sky	Mag.
12/28	16h 11.8m	+14° 07'	50°	M	11.8
01/02	16h 13.8m	+13° 02'	53°	M	12.0
01/07	16h 15.4m	+12° 05'	56°	M	12.2
01/12	16h 16.4m	+11° 13'	59°	M	12.4
01/17	16h 16.9m	+10° 27'	62°	M	12.6
01/22	16h 16.9m	+09° 47'	66°	M	12.8
01/27	16h 16.2m	+09° 11'	70°	M	13.0





JANUARY SKY SIGHTS

by Richard Bell

A new year means new opportunities for stargazing. Last year brought astronomers many wonders like Comet Hyakutake, two Lunar Eclipses (we got clouded out for one however), an "edge-on" Saturn, plus all the usual, but beautiful, wonders of the Universe. Last year was also a year of discovery. The *Galileo* Spacecraft is returning new information on Ganymede, Io, Europa, Callisto, and Jupiter itself. The Hubble Space Telescope continues to change the way we think about stars, nebula, quasars, and the universe itself. One orbiter and one lander/rover are on their way to the Red Planet. The most incredible and surprising discovery came from Mars itself this year. It has yet to be confirmed, but 1996 could have been the year life was discovered on another planet. The new year has all the potential to be yet another great year for astronomy. 1996 will be known as "Year of the Comet", and if Hale-Bopp lives up to expectations, 1997 will be known as "Year of the Super-Comet"!

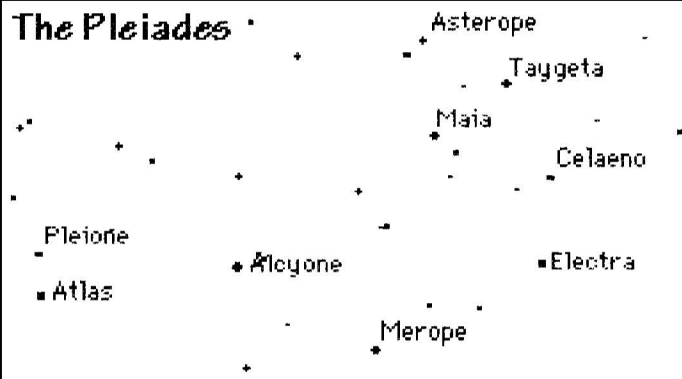
Over the past 12 months "Sky Sights" has wrote about many astronomical events. March discussed how to prepare for the Messier Marathon and April talked about starting your Herschel 400 list. September Sky Sights was all about the Lunar Eclipse (the one we missed) and some of the great opportunities for Solar System viewing that month. October Sky Sights gave a small list of the hundreds of galaxies that are visible during Autumn. December Sky Sights talked about three of the most beautiful nebula visible in the winter. I hope these were helpful to you in your celestial pursuits of 1996.

This month I'll list a selection of those enigmatic groupings of stars that are scattered all along the Milky Way. We usually refer to these colony of stars as open clusters, but since they are mainly visible along the plain of the Milky Way, we also call them galactic clusters. Open clusters are among the first objects of observation for most new amateur astronomers. It can be a little difficult to separate the cluster from the background star-field, but they're relatively easy to find and resolve. For most celestial objects you need a telescope of considerable aperture to see detail, but a simple pair of binoculars or a small beginners telescope are capable of fully resolving numbers of open clusters. Light Pollution may affect the numbers of stars you can see in a given cluster, but bad seeing really won't have a crippling affect on open clusters. They're also the easiest to draw. All you need to do is draw a circle on a piece of paper and put a little dot

with a pencil where you see a star in the eyepiece. Making indications of magnitude and color will also help you identify the cluster when you observe it at a later date. Give it a try. I would be very interested in comparing your drawings with mine.

Before we draw some clusters we need to prepare a observing list, so lets get started! When you think of open clusters the very first one that comes to mind is The Pleiades. Working at the planetarium for the past three years, I have had many people who know little of astronomy ask where they can see this cluster. It's famous for a very obvious reasons, it's visible to the naked eye. Many clusters are visible to the naked eye as fuzzy patches of light, but The Pleiades is visible as six individual stars in a small part of the sky. Turning your binoculars to this section of sky reveals several dozen stars, and a telescope will unveil hundreds. Near the Pleiades is another open cluster that can be resolved as stars with the naked eye, The Hyades. Thus "V-shaped" cluster forms the face of Taurus the Bull. The bright red-orange star Aldebaran is the eye of the bull, but this star is not associated with the Hyades.

The Pleiades

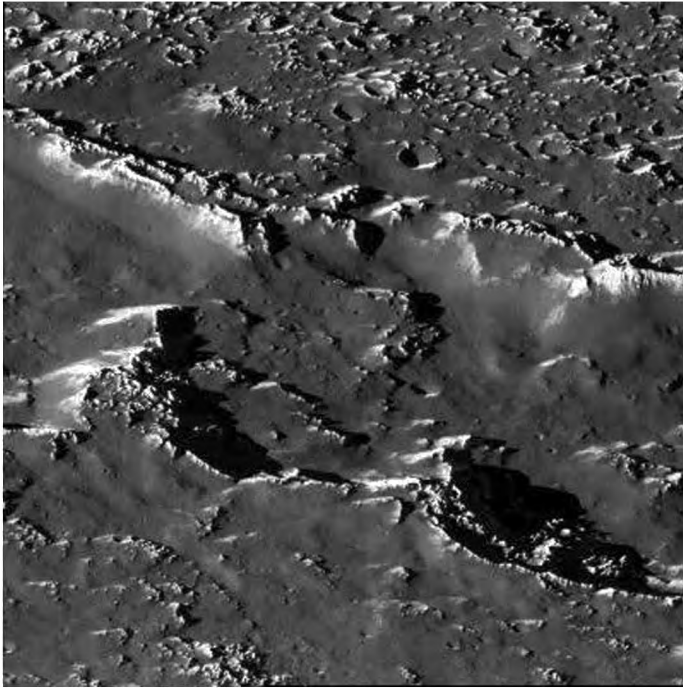


A regular smorgasbord of clusters can found in the constellation Auriga, the Charioteer. Inside of this house-shaped constellation you can find two Messier clusters and four NGC clusters. M36 is a rich collection of 60 stars from 9th to 14th magnitude. It contains many bright B-type stars which help make it the second brightest cluster in Auriga. M37 is the brightest cluster in Auriga and is considered the most spectacular of the three Messier's in this constellation. It's very rich and compact, containing over 150 stars. The total population of this cluster may be well over 500 stars and it spans 25 lightyears across at a distance of 4400 lightyears. The last Messier cluster in Auriga is M38, which lies about 2.3° from M36. The two can be viewed together in a richfield telescope. This cluster is larger in diameter than M36 and M37 and contains about 100 stars. The most distinct of the group is a bright yellow star of about magnitude 7.9. If our Sun took the place of this star it would be difficult to find at magnitude 15.3.

One last cluster(s) you cannot miss this month is the famous Double Cluster in Perseus. It's high in the northwestern sky on cold January nights, which put it in an ideal location for viewing. The combined total of stars in these two clusters is about 350. With a richfield telescope this cluster is beyond words!!!



Galileo Encounters Callisto



A Chain of Impact Craters on Callisto

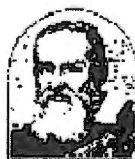
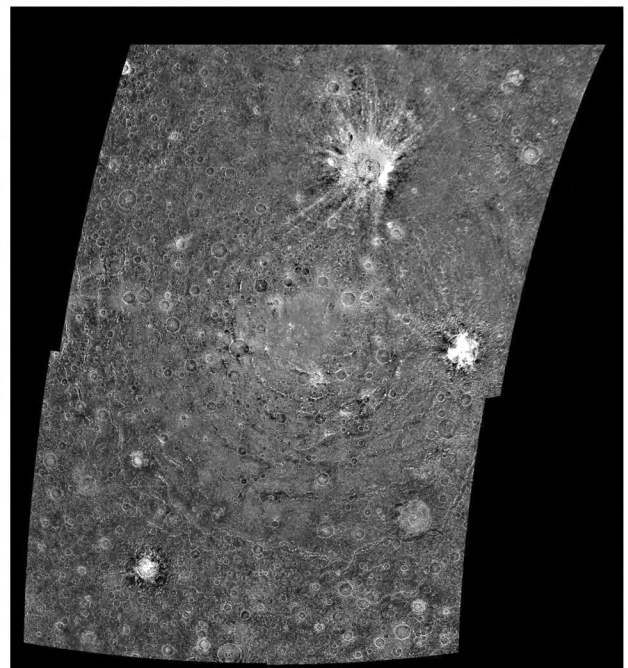
A portion of a chain of impact craters on Jupiter's moon Callisto is seen in this image taken by the Galileo spacecraft on November 4, 1996. This crater chain on Callisto is believed to result from the impact of a split object, similar to the fragments of Comet Shoemaker-Levy 9 which smashed into Jupiter's atmosphere in July of 1994. This high-resolution view, taken by Galileo's solid state imaging television camera during its third orbit around Jupiter, is of Callisto's northern hemisphere at 35° north, 46° west, and covers an area of about eight miles (13 kilometers) across. The smallest visible crater is about 140 yards (130 meters) across. The image was taken at a range of 974 miles (1,567 kilometers).

On a global scale, Callisto is heavily cratered, indicating the great age of its surface. At the scale of this image, it was anticipated that the surface would be heavily cratered as well; however, there is a surprising lack of small craters, suggesting that one or more processes have obliterated these and other small-scale features. For example, downslope movement of ice-rich debris could bury small craters. The bright slopes visible in this picture represent places where downslope movement has taken place, exposing fresh ice surfaces.

Asgard Impact Structure on Callisto

This four-frame mosaic shows the ancient impact structure Asgard on Jupiter's moon Callisto. This image is centered at 30° north, 142° west. The Asgard structure is approximately 1700 km across (1,056 mi) and consists of a bright central zone surrounded by discontinuous rings. The rings are tectonic features with scarps near the central zone and troughs at the outer margin. Several large impacts have smashed into Callisto after the formation of Asgard. The very young, bright-rayed crater Burr is located on the northern part of Asgard. This mosaic has been projected to show a uniform scale between the four mosaicked images. The image was processed by Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V., Berlin, Germany.

This image was taken on November 4, 1996, at a distance of 111,891 kilometers (69,070 miles) by the solid state imaging television camera onboard the Galileo spacecraft during its third orbit around Jupiter.



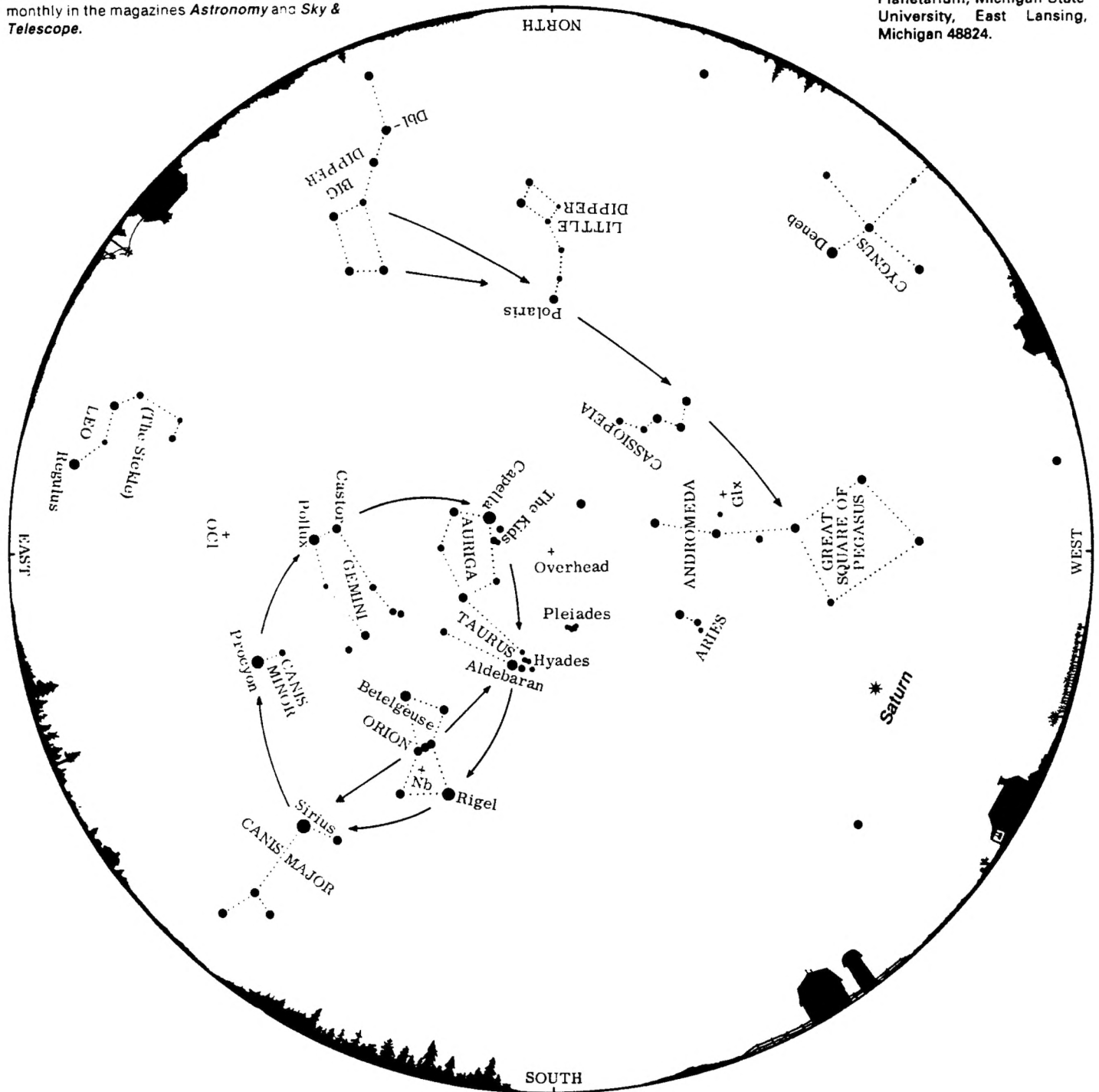
January Evening Skies

This chart is drawn for Latitude 40° North, but should be useful to stargazers throughout the continental United States. It represents the sky at the following local standard times:

Late December	10 p.m.
Early January	9 p.m.
Late January	8 p.m.
Early February	7 p.m.

This map is applicable one hour either side of the above times. More detailed charts appear monthly in the magazines *Astronomy* and *Sky & Telescope*.

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The planet Saturn is plotted for mid-January, 1997. At chart time 10 objects of first magnitude or brighter are visible. In order of brightness they are: Sirius, Capella, Rigel, Procyon, Betelgeuse, Aldebaran, Saturn, Pollux, Deneb and Regulus. In addition to stars, other objects that should be visible to the unaided eye are labeled on the map. The double star (Dbl) at the bend of the handle of the Big Dipper is easily detected.

The famous Orion Nebula, a cloud of gas and dust out of which stars are forming, is marked (Nb) in that constellation. The open or galactic star cluster (OC) known as the "Beehive" can be located between the Gemini twins and Leo. The position of an external star system, called Andromeda Galaxy after the constellation in which it appears, is also indicated (Gl). Try to observe these objects with unaided eye and binoculars.

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Coming in the February Issue **Prime Focus** takes a look at... Light Pollution

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Secrets in the Sky

Saturdays & Sundays at 1:30
Beginning January 25

Winter Stargazing

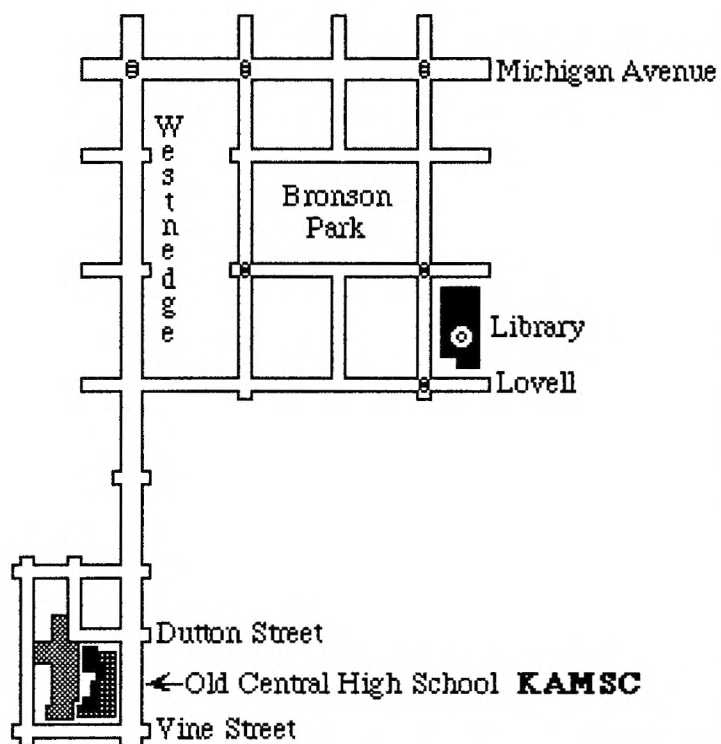
Wednesdays at 4:00
Saturdays & Sundays at 3:30

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Saturdays & Sundays at 2:30

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Map to...
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