DETROIT ASTRONOMICAL SOCIETY

NEWSLETTER August/September 1981

FROM THE PRESIDENT

Throughout the summer months, the club activities have been progressing. Mirrors and telescopes are being worked on, new members are arriving, movies and speakers are keeping us well informed about astronomical activities, trips are all on schedule and doing well. A list of past and future activities are as follows:

1) A star party was held on June 6, at G. Frey's house after 2 years of unsuccessful attempts. There were about 15 members and the skies were good enough to observe until 3:30 AM. Hope we can get a volunteer for August 8 and September 5.
2) Apollo Rendezvous was a great success with approximately 16 DAS members attending, enough to win an award for the largest club membership there. Many of our members won raffle prizes and Jack Brisbin brought down his newly finished 6" Cassegrain (which looks great).
3) About 10 club members are on their way to Stellafane for the July 31, August 1 convention. It sounded so good after planning it last year, I am going this year!
4) Anyone want to go to the ""Astrofest" this year (september 25-26) in Wisconsin? It's about a 6 hour drive from Detroit. I have written for information, so contact Gary, Ed, Mika or Harty if interested.
5) October 6, will be our Star Show at the Farmington Library. we will be locking for club members willing to take their telescopes to the library to show the public.

Gary Frey
President

HOW TO TELL TIME BY THE STARS

The Dipper is actually a great clock in the sky. In the evening the Dipper is below the pole in Autumn, to the right side in the Winter, above the pole in spring and to the left side in Summer.

You can estimate the time by observing the Dipper's position and applying the following rule. Imagine the dial of a clock in the sky with Polaris, the North star in the center. The "12" on the dial should be directly above the North star, the "6" will be directly below the North star near our horizon. The "3" will be in the East and the "9" in the West, both the 3 and 9 will be on a horizontal line through the North star. Then, the pointer stars of the Dipper become the hour hand. Look at the sky and take the "clock" reading from the pointer stars to the nearest quarter hour, add to this, the number of months that have elapsed

since January 1, to the nearest quarter month. Next, double this sum and subtract the result from 16¼, or from 40¼ if the result 1s greater than 16¼. The answer is the time in hours P.M., if the answer is greater than 12, subtract 12 and get the time in hours A.M.

You can work through the following example. The date is August 8, 1981 and the pointer stars in the Dipper indicate a clock position of 6½.

1. 1.Take the clock reading in the sky 6½ plus the number of months elapsed since January 1, or 8¼, equals 14 3/4.
2. 2. Double the number(14 3/4) equals 29½.
3. 3. subtract the 29½ from 40¼, equals 10 3/4. If the answer is greater than 12, subtract 12 and get the time in hours A.M.
4. 4. The time is about 10:45 but add one hour for daylight savings time, so the corrected time should be 11:45 P.M.

—Ed Dvorak

CALENDAR OF COMING EVENTS

August 7 -Movies: 1)"To be announced"
8:30PM 2)"To be announced"

August14 -Lecture: "Building a 12.5" f5 Modified Dobsonian"
8:30 PM by Jeffery Fesko
-Workshop Activities

August 21-Workshop Activities

August 28-Lecture: "Vision in Astronomy"
8: 30PM by Barry Carter
-Workshop Activities

Sept. 4 -Board of Directors Meeting 7:00PM
-Movies: 1) "To be announced"
8:30PM 2) "To be announced"
-Workshop Activities

Sept. 11 -General Meeting 8:00PM
-Lecture: "Western Observatories"
8:30 PM by Joseph Brown
-Workshop Activities

Sept. 18 -Lecture: "The conjunctions. ☿☌♂/☿,♃/♃
8:30 PM by Gary Frey
-workshop Activities

Sept. 25 -Workshop Activities

OBSERVERS REVIEW

<u>August</u> Venus, Jupiter and Saturn set about 2 hours after sunset. Mars rises 2½ hours before sunrise by the middle of the month.

Fri. 31 & Sat 1) Point Pelee Observing session
Fri. 7} First Quarter Moon 3:26 PM EDT.
Sat. 8) DAS star Party-location to be decided-any suggestions?
Wed.12) Perseid Meteor Shower peak 4 AM EDT. (July 25-Aug 18) about 50 per hour

Sat. 15) Full Moon 12:37 PM EDT.
Sat. 22) Last Quarter Moon 10:16 AM EDT.
Tue. 25} Venus passes 2° south of Saturn.
Wed. 26) Moon passes 1,4° south of Mars.
Voyager 2 flies by Saturn
Thur.27) Venus passes 53' south of Jupiter
Fri. 28 and Sat 29) Point Pelee Observing Session
Fri. 28
thru Sun 30) Warren Astronomical society campout at Camp Rotary
DAS members and families invited-call Doug Bock for details at 533-0898
Sat. 29) New Moon 10:43 AM EDT.
Mon 31) Aurigid Meteor Shower up to 30 per hour

September Mars rises about 4 hours before sunrise
Sat. 5) DAS STAR PARTY-location to be decided-any suggestions?
Sun. 6) First Quarter Moon 9:26 AM EDT.
Sun.13) Full Moon 10:09 PM EDT (Harvest Moon)
Thur. 17) Intelsat 5D will be launched by an Atlas Centaur
Sun. 20) Mercury 23.5' south of Spica
Last Quarter Moon 3:47PM EDT
Tue.22) Autumnal Equinox 11:05 PM EDT
Thur24) Moon 0.04° north of Mars
Fri. 25 and Sat 26) Point Pelee Observing Session
Mon. 28) New ~100n 12:07 AM EDT

During September NASA's Solar Mesosphere Explorer 1 spacecraft will be launched from western Test Range by a Delta which will also carry a British amateur radio satellite, Uasat 1, as a piggyback payload.

Japan's second Geostationary Meteorological Satellite will be launched by a Delta from Cape Canaveral.

—Nancy Waggoner

THE PINHOLE APERTURE

Sky and Telescope, May, 1981, had an article on the construction of small aperture holes or "pinholes" for use in optical testing instruments and photography. However, the author did not provide the formula to determine the size of the pinhole to be used at the desired distance to the image plane.

The formula will allow calculation of the diameter of the pinhole, when a specific distance to the image plane is required, such as in photography.

d=diameter of the pinhole(inches)
d=k~ x=distance to the image plane(inches}
k=0.008

The diameter~ a pinhole to be used at a distance of 4 inches would be: $d=0.008\sqrt{4} = 0.016$ inches. The aperture for this pinhole would be: f Ratio = $\frac{x}{d} = \frac{4}{0.016} = 250$ or f/250

small apertures provide the characteristics desired by photographers. Unlimited depth of field, distortion free images, and a uniquely soft image. Due to the small aperture, long exposure times are required. Landscapes and seascapes on windy days produce unusual results in that

the moving objects record on film as soft images. Trees are soft, and waves on a body of water would not show; the water appearing calm. Rigid objects record sharp images. Another example would be the photographing of a building with pedestrian traffic in the field of view. The building will record sharp and clear while the pedestrians would not record an image.

Single lens reflex cameras with removable lens capability are ideal as a shutter and film holder for a pinhole "lens". A 100 inch cardboard tube with the appropriate pinhole, adapted to the camera, would produce an image of the sun that almost fills the small dimension of the 35mm frame. Even with fast film however, guidance is required because the system aperture is f/1250. Another interesting photograph is a moon track taken over some interesting landscape. With a six to eight hour exposure, the scene comes out quite nicely. If, the moon is experiencing an eclipse, the entire event will be recorded.

-Bob Knoll

TELESCOPE ROSTER

We are attempting to organize an information roster of telescopes of the members of DAS. This roster will be in the form of a photograph of each members telescope along with optical and mechanical information. These photographs will also be used for a club “display board” for the May 9th star show. Photographs (black &white or color) of <u>all</u> <u>telescopes</u> is requested whether purchased or home made.

The photographs (no larger than 5 by 7) and information are needed by April 24, 1981 and must be brought to a Friday night meeting or mailed to Gary Frey, 7570 Crestmore. West Bloomfield, Michigan, 48033.

The display that Mr. Lloyd made using the photographs received to date is very impressive. I know that there are members with telescopes who have not sent photos yet, please send them so we can expand and complete our display.

The information needed is as follows:

Mirror: Size, F/ratio, Date Finished
Telescope: Type, Date Finished, Date Purchased.

—Gary Frey

PERFORATING A CASSEGRAIN PRIMARY

The process described in the article was made possible by obtaining use of a drill press. I used the I½ inch diameter brass cutting tool described in the March issue of Astra-Con. Carborundum #80 is used as a cutting agent with water to grind a 1½ inch diameter hole through the glass, which will leave a 1 3/8 diameter glass plug.

I did attempt to grind the hole at the speed of 350 rpm which is the lowest on the drill press, this produced excessive heat and wears the tool down and does not grind very effectively. The drill press must be slowed down to approximately 70 rpm, at least less than 100 rpm. I accomplished this by removing the pulley from the drill press motors output shaft and running the pulley belt directly to the out put shaft. The primary mirror should be face down (polished side down) and the back of the mirror should have a center mark scribed on it, to line up with the cutting tool, so the hole is ground through the center.

The mirror should be secured to the drill press base and a soft piece of wood or piece of rubber (tire tube) laid between the mirror and drill base. The glass will be rubbing against the drill base and cause the edges to crack or fragment, because of drill press and clamp pressure.

Next, non hardening modeling clay is used to build a retaining wall filled with water. The circular retaining wall should be about 3 inches in diameter, considering the cutting tool is 1½ inches in diameter, & about a half inch high. Press the wall firmly to the mirror so no water will leak out.

Now we are ready to grind, add the carborundum to the water, I used about a teaspoon full to start. Once the outline of the hole is ground, then you can push the carborundum into the outline. Continually monitoring the cutting action is very important, This can be accomplished by listening to the cutting action.

When you first start cutting, you will hear a loud grinding action that will fade as the carborundum breaks down. The carborundum will turn to a milky gray. This is the glass mixing with the carborundum.

If you should hear a high pitched noise or the mirror starting to "Chatter" (vibrating) this is caused by the tool rubbing against the mirror with no carborundum, which also causes heat. using the drill press handle, keep a constant pressure on the tool, but move the tool up and down, this creates a flushing action and continue to add carborundum, so it breaks down. It gives you a better grinding action and reduces grinding time. It tock me about two hours to cut through my mirror, it would have been less if I had more experience using this technique.

Continue to monitor your depth, when you have about 1/16 of an inch left, stop the grinding and knock the plug out with a piece of wood and a hammer, (or rubber mallet). Position the wood on the plug and knock the plug out the polished side with the hammer.

My mirror was already figured and silvered so I was really concerned about getting carborundum on the silvered surface and creating excessive heat that would change the figure. I tested the mirror before and after the grinding, and there was no change in the figure.

If you are planning to make a Cassegrain primary, I would grind the hole first to within a 1/16 of an inch, but don't knock out the plug till after the mirror has been figured, then have it silvered. There are probably alternate ways of doing this, it is really up to the person doing the work.

—Jack Brisbin

SECONDARIES

What size secondary should you use for your reflecting telescope? That's what I wanted to know when I first had plans of making my 10" Gregorian, I wrote about in an earlier news letter. Using the formula $S=\frac{(P)(D)}{FL}$ you, as I did, can figure out the minimum diameter your secondary should be. If visual observation is all you plan to do with your scope, this is the only formula you need. However, if you plan to use your scope for prime focus photography you might be interested in the next formula I came up with. First you would use that first formula, then pick out the next two diagonal sizes larger and put each into this formula $\frac{(FL)(S) - (D)(P)}{P-S} = x$

Take x and put into this formula FD = $\frac{(P)(X)}{FL+X}$. FD should be no less than .5 and no greater than 1.0. This will produce a finer photograph. Note: since most secondary holders decrease the size of its diameter, you might want to compensate.

Key: p=diameter of primary
S=diameter of secondary
FL=focal length
D=distance from secondary to focus point
FD=film diameter

—John Staschke

MIRROR ACTIVITY UPDATE

Brian Keller and Kevin Dehne are still working on their 8" f6 mirror.

Duncan Payne, grinding a 6" f6 mirror, and Frank Grondzieleski, polishing his 8", have been away for a while.

Dave Corkery has begun grinding his 4¼"f10

Kitty Judd is re-figuring on her 8" mirror to improve its optical quality.

—Marty Kunz & Mike Manyak

NEW MEMBERS SINCE APRIL 1, 1981

Jeffery D. Thrush
Marc Stavenga
William Dawson

SOME IMPORTANT DATES

August 18 Ch. 56 8:00PM-voyager:Jupiter and Beyond

August 24 Ch. 56 8:00PM-Greatest Adventures-Space Exploration

Sept.25-26 "Astrofest"