WESTMINSTER ASTRONOMICAL SOCIETY
of Carroll County, Maryland

Newsletter for August 1985, Vol 2 No 8

August Meeting

Dr. Richard Griffiths of the Space Telescope Science Institute in Baltimore shall be guest speaker at the August meeting of the Westminster Astronomical Society, on Wednesday, September 4. Dr. Griffiths, an X-ray astronomer and formerly associated with the European Space Agency (ESA), will be discussing X-ray astronomy.

Dinner with Dr. Griffiths begins at 6:15 p.m.at Fan's Restraunt, 59 W. Main Street, Westminster. The 7:30 meeting shall be in the Dixon Room of the Carroll County Public Library main branch, 50 E. Main Street.

President's Message

I am pleased to present to you the newest appointed office. Mike Potter has assumed the duties of Observing Chairman. This position requires someone with extensive observing experience, such as Mike. An amateur astronomer for nearly two decades, Mike has observed 1500 objects in the New General Catalog (NGC). Mike independantly discovered Comet 1970 XV. Mike submitted his telegram but unfortunatly not before Osamu Abe of Japan, whose name is borne by the comet. Mike has started preparing a series of articles on amateur astronomy for the club. The first issue was excellent and I can't wait to see those that follow. For those who did not get a copy of Observational Astronomy #1 at the July meeting, additional copies shall be available at the meeting September 4.

Curt Roelle

Halley Recovery Party Rescheduled

Because of poor weather both nights of August 16 and 17, the August star party has been rescheduled for Friday, August 23. The location is unchanged, being 3481 Salem Bottom Road, about seven miles south of Westminster. The star party will begin at 8:30 p.m.; twilight ends at 9:30. You may come and go as you please throughout the night. Best viewing of Comet Halley shall begin around 3:45 a.m. In case of poor weather, The fourth and final rain date for the August star party shall be the following night, August 24-25. In case of inclement weather or for detailed directions from anywhere, call Curt at 848-6384.

You are advised to bring a lawn chair and blankets. You can snooze until the moon sets, when clouds temporarily roll in, or just get a few hours of sleep until Comet Halley is well up.

WAS Observational Astronomy Supplement

Observing Chairman Mike Potter has put together an 8-page feature entitled Observational Astronomy #1. In it the reader will find a wide range of information including observing tips

and suggestions for amateur projects. The first issue contained information on meteors including a list of the 10 or 11 most prominent showers that occur in August; a comet supplement with ephemeris data for comets P/Halley and P/Giacobini-Zinner; and information, an illustration, and observing forms for Jupiter and Saturn. Also there was a 20-frame sequence depicting the bunching of three of Jupiter's Gallilean Satellites on August 29. This sequence was prepared using a computer program written by Mike that came from Jean Meeus' book Astronomical Formulae for Calculators. Anyway, those who have a copy of Observational Astronomy will get much from reading it. Those who do not may obtain a copy at one of the star parties or monthly meetings.

Early Stellafane Report

Several WAS members returned today (18-Aug) from the annual Stellafane Convention in Springfield, Vermont. Stellafane has been a tradition among amateur astronomers since the first convention was held atop Breezy Hill in 1926. WAS conventioneers were Blaine Roelke and Dave Pessagno, and Mr. & Mrs. Michael Potter. Dave reports that he and Blaine arrived on Thursday, the only night that it rained. Once the convention got underway Friday the skies cleared and good weather continued for the remainder of the convention. Speakers included the renowned telescope-maker Robert Cox, and Sky and Telescope's legendary Deep Sky Wanderer Walter Scott Houston.

Saturday featured a three-hour panel discussion of Halley's Comet with John Bortle, conducter of "Comet Digest" in Sky and Telescope magazine, Dan Green, comet expert from the Harvard-Smithsonian Center for Astrophysics, and Stephen James Omeara, the first person to observe Halley visually since E.E. Barnard on May 23, 1911. Mr. Omeara made his observation in January of this year using a 24-inch telescope atop Mauna Kea in Hawaii (Sky and Telescope 4/85 pp. 376-7).

Joint WAS/BAS star party September 13 in Reisterstown

WAS member Dave Pessagno has TEMPORARILY scheduled a star party for 9:00 September 13 at his home, 45 Franklin Valley Circle, Reisterstown. Dave is former President of the Baltimore Astronomical Society and owns an observatory equipped with a 13.1" Odyssey I made by Coulter Optical. More information including a map will be available at the September 4 meeting, or thereafter by calling Dave at 526-5128.

July Lecture

WAS' own Mike Potter spent 15 nights photographing globular clusters with a 40" Boller & Chivens telescope from the Israeli desert near the town of Mitzpe Ramon in June. This was part of a research project being directed by an astronomer from the Space Telescope Science Institute. The purpose of this research is to detect evidence of binary stars in globular clusters.

At least half of all stars are double or multiple, meaning they exist in a system where two or more stars orbit a point which marks the system's center of mass, or barycenter. The sun is a lone star and is unique in this respect, though sometimes Jupiter is regarded as a brown dwarf, or failed star, in which

case our solar system contains a double star and is thus not so unusual after all.

In a globular cluster the density of stars is greater than in the neiborhood of the sun so one might expect that a greater abundance of multiple stars should exist in globulars. Physically it is possible that in a three-body interaction between stars, two may become gravitationally combined into a double star. Naturally the denser the stars, the more likely three-body interactions are bound to happen. On the other hand, three-body interactions between a double star perturbed by a third star could cause the double star to be split, setting the pair free. In fact the latter scenario is more common and more double star pairs are broken than can be formed in a globular cluster. This reduces the chances of finding double stars there.

Globular clusters are located at great distances and thus it is unlikely that the individual stars in a binary or multiple system could be seen visually. Eclipsing binary stars such as Algol could be observed. In an eclipsing binary, the stars are seen edge-on along the plane of their orbit. Thus eclipses occur when the stars pass in front of each other. Although from earth the stars are too close together to distinguish and appear as one star, the star will fade and grow in brightness during each eclipse. Searches for eclipsing binary stars in globular clusters have had negative results.

Another type of double star is the spectroscopic binary. Like the eclipsing binary, the individual stars appear as one because of their closeness to each other and distance from earth. As they orbit their barycenter they move closer then further from earth similar to racing cars going around a track. As a car approaches an observer the pitch in sound of the engine increases. When the car passes the observer and begins to recede, the pitch drops. This is the doppler effect. In the case of multiple stars the light -- not the sound -- changes "pitches", being shifted toward the blue and then the red end of the spectrum as the star approaches and then recedes. Spectrums of stars taken over a period of time would reveal those double stars that are particularly prominent using this method. So far none have been found in globular clusters.

Some double stars are odd couples. These may consist of a giant red star orbited by a relatively miniscule white dwarf -- a celestial Laurel & Hardy. However, the smaller star is millions of times denser than the larger companion. If the stars are close the gravitational pull of the white dwarf may actually draw matter away from the large star, into a spinning disc surrounding the dwarf. This disc is called an accretion disc. At the point where the stolen matter contacts the disc extremely powerful X-Rays may be produced. (The Einstein X-Ray astronomy satellite has detected X-Ray sources in the direction of globular clusters.) The excess mass continues to acrete until a reaction occurs that causes the surface of the white dwarf to explode. The process then begins over again and is repeated periodically. These objects are called cataclysmic variables, and the hope of finding them in globular clusters brought Mike to Israel.

Mike spent 15 nights photographing the globular clusters M3, M4, M5, M10, M13, M15, M22, M71, and M92 (M=Messier). A charge coupled device (CCD) with a resolution of 320 X 512 pixels (picture elements) was used to obtain images. Because of the narrow CCD field six images in a 2 X 3 arrangement were made for each

cluster during the observing run. Photographed would not be a proper term since film was not employed. The data was recorded on magnetic tape and returned to the United States for image processing at the Institute, using a Large Vax (model 8600) computer.

It is known that the light curve, or **Point-Spread Function**, of normal stars recorded by a CCD are the same regardless of stellar magnitude. The function is larger for brighter stars and smaller for fainter stars, but the shape for both is similar. Thus in image processing, a star may be easily removed from the image by subtracting its point-spread function. It is hoped that image processing of this type will help determine if cataclysmic variables, and thus binary stars, exist in globular clusters.

WAS CALENDAR

August 23-24	8:30 p.m.	Halley star party, Curt Roelle's
24-25	8:30 p.m.	Halley star party rain date
September 4	6:15 p.m.	Dinner with Speaker, Fan's Restraunt
4	7:30 p.m.	WAS meeting, Dixon Room CCPL
September 13	9:00 p.m.	Tentative Star Pary, Dave Pessagno's

Latest Star Party Forcast, August 23-24:

COMET HALLEY

POSITION AT 0H U.T. 24-AUGUST-1985

RA 05.1M DEC +40 44M

FROM WESTMINSTER THE MOON SETS 12:15 A.M., SATURDAY AUGUST 24. IT IS DARK WHEN COMET HALLEY RISES AT 1:55. BY 4:00 COMET REACHES ALTITUDE OF 22 DEGREES. ALTITUDE OBTAINS 33 DEGREES WHEN TWILIGHT BEGINS AT 4:51. DESPITE LUNAR INTERFERENCE, HALLEY IS BETTER PLACED THAN ON ORIGINAL STAR PARTY DATE OF 16-AUG.

Westminster Astronomical Society

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WHO WAS MR. HALLEY?

Edmund Halley was born in 1656 near London, England. The period during which he lived was a magnificent time filled with great works of art and music, and tremendous advances in science. During his childhood London was besieged by the Black Death, but young Halley survived. After attending Oxford, Halley published several scientific works including one on Kepler's laws of motion, and a catalog of 341 southern stars he observed from the island of St. Helena.

Edmund Halley (1656–1742), English astronomer, was a close friend of Isaac Newton and oversaw the publication of Newton's *Principia*. Halley was active in many areas of astronomy, but he is best known for his pioneering study of comets and for the realization that the comets of 1531, 1607, and 1682 were the same one. He predicted the return of that comet in 1758. This most famous of all comets bears Halley's name. *(Yerkes Observatory)*

At the age of 25 Halley observed the great comet of 1682. He began looking back over the records of other comets that had occurred throughout history. He noticed that the comets of 1531, 1607, and 1682 had similar characteristics. Halley deduced that these were three sightings of the same comet and predicted the next appearance would be in 1758-59.

Edmund Halley was appointed Astronomer Royal in 1720, a position held until 1739 when his health began to fail. On January 14, 1742 Halley died. When he predicted the return of the comet, Halley realized he would not live to see it fulfilled. But on Christmas night in 1758 Johann Georg Palitzch, a Dresden farmer and amateur astronomer, became the first to spot the returning comet. Ever since, this comet has borne the name of Sir Edmund Halley.

WHEN AND WHERE WILL I GET TO SEE COMET HALLEY?

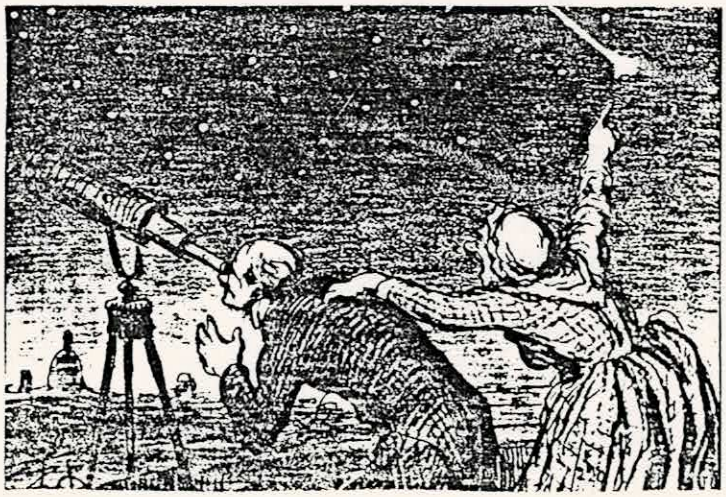
Unfortunately, the 1985-86 apparition will not be especially favorable. The comet will be brightest at its closest approach to the sun, or **perihelion**. At perihelion, on February 9, 1986, the comet will be on the opposite side of the sun from Earth, and hence unobservable. As the comet emerges from the sun's blinding light in the morning sky during the following months, it will sink lower in the south. The reason for this is that the comet crosses the equatorial plane of the Earth.

Because Halley will be far from earth and hence faint, and low in the southern sky, it will be difficult to observe from the Northern hemisphere. Combined with the alarming overuse of artificial outdor lighting most people may not see the comet at all. Remember Kohoutek?

The comet should become visible in binoculars by December, as shown in the adjacent timetable. It will brighten in January and not be visible in Febrary as it rounds the far side of the sun. In March and April, Halley is at its brightest. Closest approach to the earth is 38 million miles on April 11, 1986.

WAS is offering a personal guide to the comet, **Mr. Halley's Comet**, that you can take with you for only $2.00. With this guide at your fingertips you will be ready when the time comes for the once in a lifetime experience of seeing Halley's Comet. The booklet contains:

- historical and scientific information
- finder charts
- timetable
- star map showing comet path
- instructions for observing with telescope or binoculars
- guide to photographing comet



Halley's Comet

When can I see it?

From North America (and elsewhere at mid-northern latitudes), here's how Halley's comet will look:

Pre-August,1985 — Still far away, Comet Halley is extremely faint. The world's largest telescopes will photograph it as a vague smudge of light.

August-September, 1985 — By now the comet is just bright enough for experienced amateur astronomers with large telescopes to find it.

October, 1985 — Late this month, when moonlight is no longer a problem, the comet should be widely spotted by those looking with small telescopes.

November, 1985 — Growing steadily brighter, Halley can now be seen in binoculars. It will be in the eastern sky just after darkness. On Nov. 15 and 16, it passes just south of the Pleiades.

December, 1985 — Halley becomes barely visible to the naked eye under ideal (very dark) conditions. Binoculars give a better view. The comet is high in the southern part of the sky.

January, 1986 — The comet brightens slowly, but each night after dusk it is lower in the western sky. By the 25th it sets before dark.

February, 1986 — Halley can't be seen most of this month. But during the last week of February it reappears in the morning twilight sky in the east.

March, 1986 — The view gets better. Near the end of the month, and just before morning twilight begins, Halley sports an excellent long tail in the southeastern sky.

April, 1986 — Halley is at its best! Toward the end of the first week of April, as moonlight ceases to be a problem, the comet will appear at its brightest. Unfortunately, it's very low in the southern sky before dawn and descending rapidly toward the horizon.

May, 1986, and after — Halley departs into deep space once again. High in the night sky, it can be followed with binoculars through May and with telescopes until early August. No one will set eyes on the comet again until around 2061.

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