

The Westminster Astronomical Society

In Cooperation With

Carroll County Parks and Recreation

Presents:

A COMET FOR CHRISTMAS:

The 1985-1986 Apparition of Halley's Comet

Two Hundred and eighty years ago (1705) Sir Edmund Halley made the discovery that has guaranteed him lasting fame ever since. Tonight you shall observe this comet which Halley himself saw in 1682 at the age of 25. Halley's comet orbits the sun every 76 years. The current apparition, or return, is only the fourth since Halley's observation. The others were in 1759, 1835 and 1910. We thank you for coming tonight and hope that you enjoy your opportunity to see Halley's Comet.

Tonight's Program

The program is composed of two parts: informational and observational. The informational program is held indoors and features a slide show prepared by the Astronomical League. The slides have been generously loaned to the Westminster Astronomical Society (WAS) by the Baltimore Astronomical Society. Following the slide show you shall exit into the cold dark night air.

You shall be led to the observing site. Several telescopes varying in size and type will allow you to observe Halley's Comet with your own eyes. If the night is very clear, you may even see Halley's Comet with the naked eye, as several WAS members have already.

Halley's Comet is not the only celestial wonder that can be seen with a telescope. Therefore other telescopes are set up to show you a variety of objects as an encore to Halley's Comet. Please feel free to ask the telescope operators any questions you may have.

Following the program you may warm up with free coffee and refreshments served compliments of the Parks Department.

Observing Halley's Comet

Halley's Comet is currently about 70 million miles from the Earth and getting farther away. From November until April the Earth and Halley travel around the sun in opposite directions. When they reach the other side they will begin to get closer together until April 11 when the separation is under 40 million miles. The best views then will be from south of the equator.

In the telescope, Halley's Comet appears as a fuzzy round cotton ball called the COMA. A bright "star" is seen in the center of the coma. This is not the NUCLEUS, but rather a CENTRAL CONDENSATION. The nucleus is too small to be observed by any telescope on earth. The TAIL may not yet be visible.

If you know what to expect you will not be dissappointed with what you see.

## THE WESTMINSTER ASTRONOMICAL SOCIETY

WAS held its first meeting in May, 1984. Membership is open to anyone interested in astronomy. The following are the most commonly asked questions:

"When and where does WAS meet?"

Meetings are held monthly on the last Wednesday, usually at Western Maryland College. Expert guest speakers address the group about 50% of the time. Meetings are always free and open to the public.

"Do I have to buy a telescope before I can join?"

No. Astronomy is much more than just telescopes. Your eyes are the basic equipment, a telescope could come later if you wish.

"Will I get the chance to look through a telescope?"

Yes. One of the benefits of joining are the monthly "star parties" where members get together at a dark site to observe with our telescopes. This is a good chance for those who don't own them to get to see through one.

"What else will I get for joining?"

You get to meet others with a similar interest -- that is the biggest benefit of belonging to the WAS. There is also an informative newsletter that tells of events in the club and around the world of astronomy.

"Are dues expensive?"

There are two classes of members:

Single Membership	\$11 per year
Family Membership	\$13 per year

Paid members enjoy all of the above benefits plus voting privileges at the yearly business meeting.

"Where can I get more information about WAS?"

The mailing address is:

Westminster Astronomical Society  
3481 Salem Bottom Road  
Westminster, Maryland 21157

A self-addressed stamped envelope would be appreciated.

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Dear Visitor:

Thank you for sharing Halley's Comet with us tonight. We hope to meet you again in the very near future.

Sincerely,  
*Curtis W. Roelle*  
Curtis W. Roelle  
President



## WESTMINSTER ASTRONOMICAL SOCIETY

3481 Salem Bottom Road, Westminster, MD 21157

### 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.

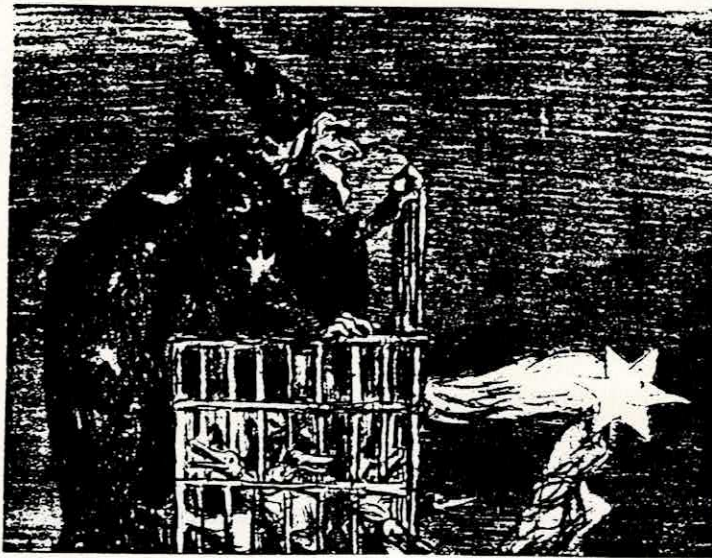
At the age of 25 Halley observed the great comet of 1682. He began looking back over the records of other comets that had occurred throughout history. He noticed that the comets of 1531, 1607, and 1682 had similar characteristics. Halley deduced that these were three sightings of the same comet and predicted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



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*)





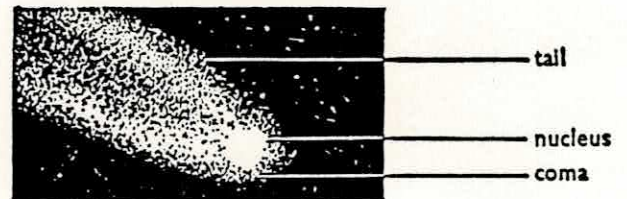
#### WHERE DO COMETS COME FROM?

Although a single answer to the question of where comets come from has not been accepted by all astronomers, a majority agree that comets are "dirty snowballs" composed of frozen gasses mixed with dust. Comets are believed to orbit the sun in a large shell known as the Oort Cloud located some 50,000 times farther from the sun than the earth. There are estimated to be over 100 billion comets in the Oort cloud, with a combined mass equivalent to that of the earth.

At such a distance from the sun, a comet may be perturbed by distant stars as they pass by, over a course of thousands of years, altering the orbit and causing the comet to plunge toward the sun. Most comets spend thousands of years on the sunward journey, only to swing around the sun and be flung, as if by a sling-shot, back out into space never to return again. Sometimes a comet will pass near a planet such as Jupiter or Saturn, whose gravitational force alters the comet's orbit. The comet may then be "captured" by the sun, and will orbit it like a planet. Halley is such a comet. It orbits the sun in a very elliptical orbit once every 76 years.

#### WHAT ARE COMETS MADE OF?

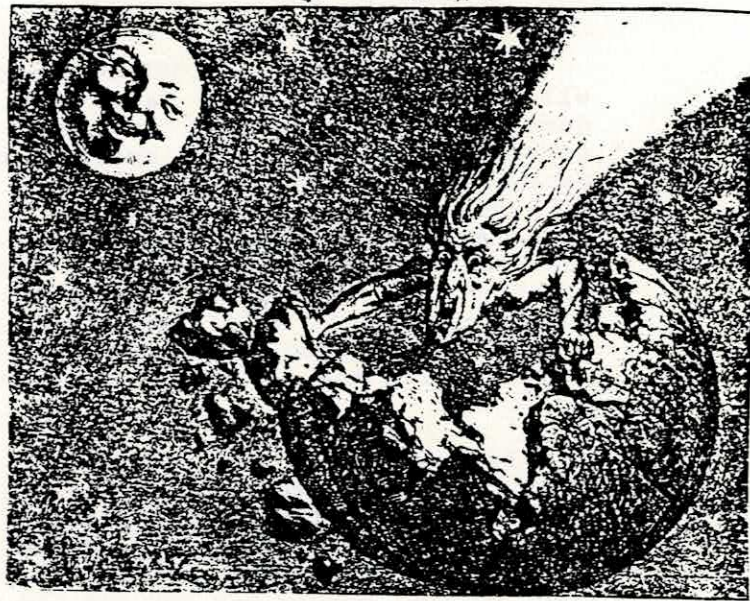
Comets are relatively small, the nucleus being only a few miles across. As the comet approaches the inner solar system, volatile materials such as water sublimate to form a coma or "hair" around the nucleus. As the comet approaches the sun, the pressure of the solar radiation or "solar wind" causes the tail to form. Comet tails have been known to reach 100 million miles in length, more than the distance that separates the earth from the sun. This is remarkable considering the tiny size of the nucleus.





### CAN A COMET DESTROY THE EARTH?

In a human lifetime, the possibility that a comet will hit the earth is infinitesimal. In 1910 Comet Halley came closer to the earth than it will in 1986, and the earth actually passed through the tail. This encouraged sales of special "comet pills" and gas masks to protect a misinformed public from the poisonous gases that were expected to engulf the planet. Many people boarded their doors and windows as well. The comet passed and the earth suffered no harm despite the predictions of some fanatics that the earth would be destroyed.



What would happen if a comet were to strike the earth? Scientists believe this has already happened -- in this century. In Siberia in 1908 an explosion occurred that had the equivalent force of a hydrogen bomb. This "Tunguska Event" flattened a forest, and the heat blast was felt some 40 miles away. The fireball was observed 600 miles away as it streaked toward ground zero. The shock registered on seismometers around the world, but no human deaths were reported. However it is not hard to imagine what effects an impact in a populated area would have. A comet striking the ocean would unleash great tidal waves that would sweep over land, and alter coastlines.

A more intense impact is thought to have occurred some 66 million years ago, leading to the extinction of the dinosaurs. Some scientists believe smaller extinctions happen roughly every 20 million years, perhaps when the earth is struck by a comet or asteroid.

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*In 1908 a small piece of a comet hit Siberia and the blast wave flattened the forest over thousands of square kilometres.*





## 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 outdoor 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 February 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



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### 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 south-eastern 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.

Brought to you by the editors of  
**Sky & Telescope**



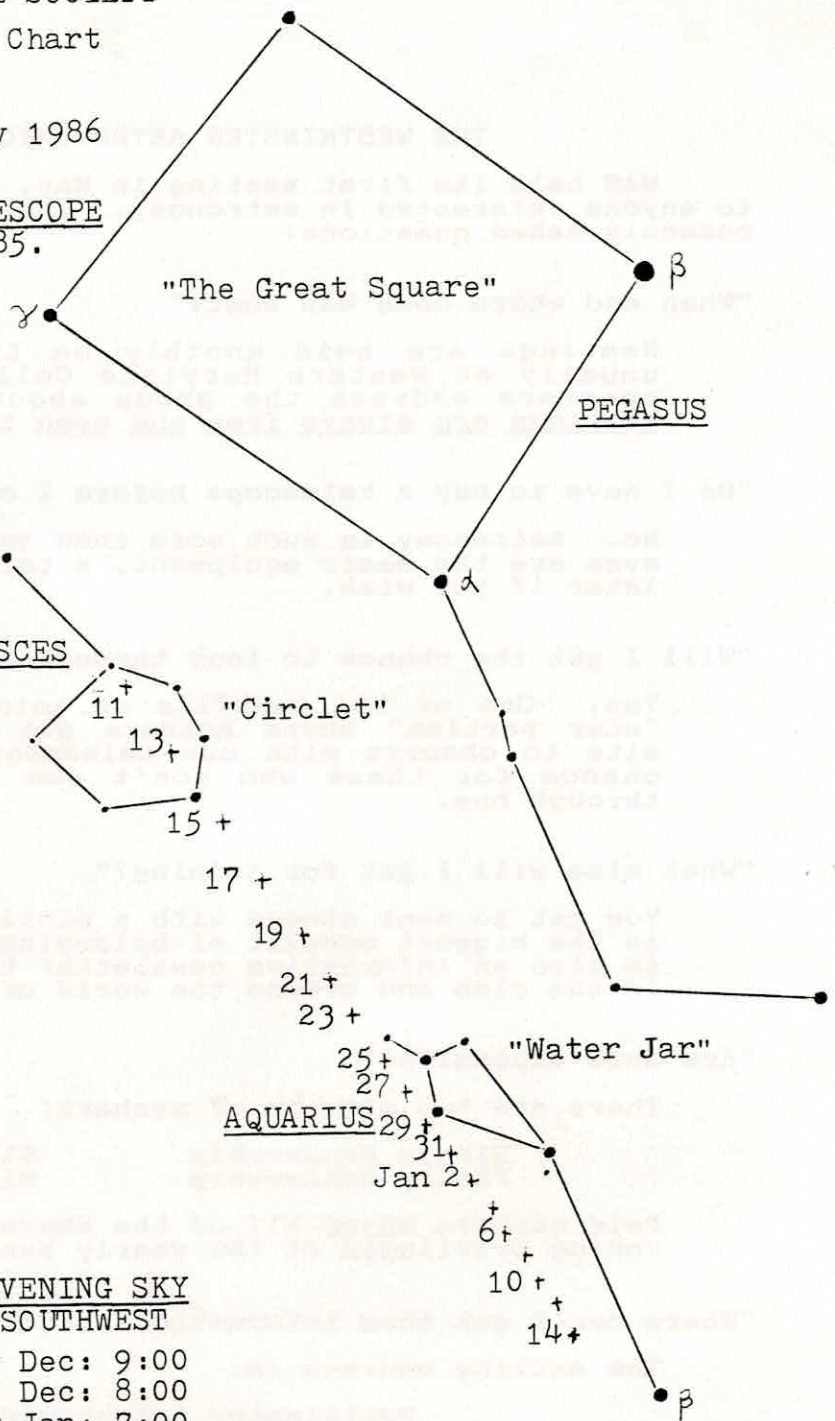
WESTMINSTER ASTRONOMICAL SOCIETY

Comet Halley Finder Chart

for

December 1985 & January 1986

Adapted from SKY & TELESCOPE magazine, December, 1985.



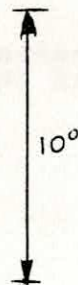
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THE EVENING SKY  
FACE SOUTHWEST

Early Dec: 9:00  
 Mid Dec: 8:00  
 Early Jan: 7:00  
 Late Jan: 6:00

• Fomalhaut



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Southwest