

## Comet Observers Program Chair:

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In observing the wonders of the universe, there are perhaps no more wondrous and beautiful objects as comets. Since the invention of the telescope hundreds of years ago, astronomers have continually searched for new comets, and in the process, have discovered nebulas, star clusters, galaxies and more. Comets are important members of our solar system, and their study is important to mankind. Thus, having this observing program for members of the Astronomical League is long over due. We hope you enjoy your quest!

### COMET TUTORIAL

Unlike the other small bodies in the solar system, comets have been known since antiquity. There are Chinese records of Comet Halley going back to at least 240 BC. The famous Bayeux Tapestry, which commemorates the Norman Conquest of England in 1066, depicts an apparition of Comet Halley.

As of 1995, 878 comets have been cataloged and their orbits at least roughly calculated. Of these, 184 are periodic comets (orbital periods less than 200 years); some of the remainder are no doubt periodic as well, but their orbits have not been determined with sufficient accuracy to tell for sure.

Comets are sometimes called "dirty snowballs". They are a mixture of ices (both water and frozen gases) and dust that for some reason didn't get incorporated into planets when the solar system was formed. This makes them very interesting as samples of the early history of the solar system.

When they are near the Sun and active, comets have several distinct parts:

**nucleus:** relatively solid and stable, mostly ice and gas with a small amount of dust and other solids;

**coma:** dense cloud of water, carbon dioxide and other neutral gases sublimed from the nucleus;

**dust tail:** up to 10 million km long composed of smoke-sized dust particles driven off the nucleus by escaping gases; this is the most prominent part of a comet to the unaided eye;

**ion tail:** as much as several hundred million km long composed of plasma and laced with rays and streamers caused by interactions with the solar wind.

Comets are invisible except when they are near the Sun. Most comets have highly eccentric orbits which take them far beyond the orbit of Pluto; these are seen once and then disappear for millennia. Only the short- and intermediate-period comets, stay within the orbit of Pluto for a significant fraction of their orbits.

## **COMET AWARD LEVELS**

Observers can receive a certificate from the Astronomical League for two different levels of observations. A lapel pin will also be awarded for the Silver Level. The levels are:

### **Silver Level - observe at least 12 different comets.**

Comets observed and logged can be at any magnitude. Two of these comets can be observed prior to January 1, 2001, considering that all appropriate documentation is provided.

### **Gold Level - observe at least 18 additional comets**

Comets observed and logged can be at any magnitude. Two of these comets can be observed prior to January 1, 2001, considering that all appropriate documentation is provided.

The observations can be accomplished through the use of:

- binoculars
- observatory telescope
- observer's personal telescope
- or accessible robotic telescope.

The observer can make these observations visually (eye to eyepiece) and hand sketch the comet. Or the observer can image the comet by using camera and film or by using a CCD camera.

## **WHAT TO DOCUMENT**

Your observation log should be recorded in a notebook, hard copy print out or some other method. You can also use the observing form attached. Whatever method you use to record your observations, the following needs to be included:

- (1) Name of the observer, email and location of the observer
- (2) Date and time of observations/image and location at which the observation/image taken
- (3) Official designation of the comet and name

(4) The size of the telescope, location of telescope, exposure length, time of exposure (UT time) and additional information, power used, etc

(5) Documentation of observations:

(5a) A sketch/ drawing or CCD image or photograph. When it is a faint comet with no tail, at least two should be submitted indicating the movement of the object against the background stars. Planetarium programs may be used to indicate comet position and stars names.

(5b) Regarding the drawings made by the observer- The nucleus, tail and background stars (drawn as dots) should be identified and labeled especially when the comets are very faint and non-comet like (little or no tail or coma). Tick marks can indicate the direction of movement against the star background, indicating hourly/ daily movement of fainter comets, to indicate movement against the stars either on a hourly basis or over two nights.

(5c) Computer based images can be submitted on 3.5-inch floppy diskette, CD, or ZIP disc in jpg, gif, or tiff format or on a html page, word document, etc. Images can be inverted (a negative exposure) if it brings out more detail in the comet. The name of a electronic file should indicate the common name of the comet and/or letter designation and date photographed-month/date/year (example, Ikeya-Zhang2001c10402).

(5d) Each photograph/image should be numbered and identified appropriately in the log/journal (ex. cometlinearwm1112001.jpg)

(5e) Photographs/Images can be printed out and included with the journal/log either background sky as dark with stars and comet white on black or an inverted image (black on white). An option is place the images on an html page, PowerPoint or other multimedia product on a ZIP disc or 3.5-inch floppy diskette. Appropriate documentation of the files and application used should be also sent.

(5f) While comets are quite noticeable because of the coma/tail, two or more observations should be used to verify the motion and identity of the comet that is dimmer than 6th magnitude and/or does not have a noticeable tail or coma.

## **PROGRAM RULES**

The rules for obtaining a Comet Award as follows:

1. Be a member of the Astronomical League, through either an affiliated club or as a member-at-large.
2. Observe comets as a group or individually.
3. Each observer should keep his or her own data on the report form or own log system.
4. The completed observing report should include the following submission/index information: Observer's Name, Observer's E-mail address, Address of observer, and a listing of the comets included in the final submitted report.

5. To receive either the silver or gold comet observer award, the log and all the above listed information must be sent to me, Scott Kranz, for verification and **NOT** to your club's award coordinator.

## **FREQUENTLY ASKED QUESTIONS**

Here are the answers to your most frequently asked questions:

1. Only 1 pin is given for both silver and gold awards, and it is sent with the silver certificate.
2. There is a different certificate for silver and gold.
3. Each certificate (silver and gold) has a picture of the pin in the middle of the bottom.
4. Comet observations can be used after 1/2001.
5. 2 comets before 2001 can be used for silver. Total for this award is 12 comets.
6. 2 comets before 2001 can be used for gold. Total for this award is 18 comets ( beyond the silver's 12 comets). In other words, once you have received the gold certificate, you will have observed and logged 30 comets total.
7. Awardees can mix and match sketches, CCD images and regular film pics.
8. The information and data and #7 info should be sent to me for verification.
9. Awardee should also send me their email address.
10. Awardees should let me know if they want the data etc back which I am happy to send with the certificate(s) and pin (with the silver award only).
11. Send in for silver and don't wait to do the gold.
12. Awardees should also let me know if they want the certificate sent to the award chairman of the club instead for awarding at monthly meeting. Please let me know both the EMail address and the names and US Mail addresses of both awardee and your clubs' award chairman. Please be very clear about where you wish your award certificate to be sent.

## **COMET RESOURCES**

This observing program wouldn't be possible without the use of computers and the Internet. While none of the following resources are officially endorsed by the Astronomical League, many of them provide information that will be invaluable to program participants.

Comet Chasing

<http://www.skyhound.com/sh/comets.html>

Weekly Bright comets

<http://www.aerith.net/comet/weekly/current.html>

Kronk's Comet page

<http://comets.amsmeteors.org/>

Potentially observable comets

<http://cfa-www.harvard.edu/iau/Headlines.html>

Sketching a comet

<http://hou.lbl.gov/~vhoette/Comets/cometexp.html>

SOHO comet hunting

<http://sungrazer.nascom.nasa.gov/>

What's observable tonight

[http://ssd.jpl.nasa.gov/cgi-bin/what\\_obs](http://ssd.jpl.nasa.gov/cgi-bin/what_obs)

British comet page

<http://www.ast.cam.ac.uk/~jds/>

Yoshida's home page

<http://www.aerith.net/>

## **SUMMARY**

To receive your Comet Observers Certificate and/or pin, send a copy of your observations along with your name, address, phone number, and club affiliation to:

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106 N Darrowby Drive

Raymore, MO 64083-9181

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E-mail [s.kranz1@comcast.net](mailto:s.kranz1@comcast.net)