CELESTIAL OBSERVING CHALLENGE

This program was developed for use by amateur astronomers and astronomy clubs. Because beginners can be overwhelmed by long lists of challenging objects, this program breaks down longer observing lists into smaller chunks, that individuals will find easier to track. The program takes types of astronomical objects and places them into groups based on the categories listed below:

Solar System Group
Binocular Group
Star Associations Group
Naked Eye Group
Sagittarius Group

These groups will expose observers to a variety of objects and encourage the use of various instruments, including the one all observers possess--the human eye. Some groups require the use of a small astronomical telescope and binoculars are obviously required by that group. The Star Associations group gives you a choice of instruments. Whatever you choose to observer, the main point of this exercise is to learn something new about the night sky and most of all, the have fun!

This program originally awarded observers who completed each group with a postcard that was developed by various members of the Cuyahoga Astronomical Association. This program does not include such rewards, however, astronomy clubs can develop their own certificate, postcard or other small token of reward for their members. If you are interested in the source files (MS Word) of this program to add your own touches or craft your own clubs certificate, please contact Astra at: astra@astras-stargate.com

Use the pages in this document to track the objects from the group of your choice. By clicking on the title of the group, you will go right to the observing form of the group you want.

SOLAR SYSTEM GROUP

The solar system group must be observed with a telescope. Planets that are easy to find in the night sky are included. Emphasis on lunar features and Jupiter's markings will help to familiarize observers with locating these details. There is an article on Astra's Star Gate with advice on observing our solar system's largest planet, Jupiter. For extra credit, search for the latest comet using the links provided by Astra's Comet page.

BINOCULAR GROUP

Binocular objects, of course, must be observed with a pair of binoculars. For steady views, a tripod is preferable. Simple equipment may be used of course, but you'll find that better optics and larger apertures are helpful. Astra's Star Gate has more information on binocular observing and you'll find lots of resources sited on various pages and much, much more by surfing the web yourself.

STAR ASSOCIATIONS GROUP

You'll have to use an instrument to find these objects. This group was developed to feature stars, emphasizing that they are often found clustered in groups. Some stars are gathered in large spheres or ball, called globular clusters, others are only loosely associated and gather in irregular clusters that we call open clusters. Scientists are challenged to determine whether these stars are really associated or if it is a trick due to line of sight. Some stars are shier and gather in mere groups of two or three. We call these double stars. Loners like our Sun seem to be few and far between. Older stars form planetary nebula.

NAKED EYE GROUP

It is estimated that over 6,000 stars are visible in the night sky without an instrument. The light and dark contrasts of lunar features can be easily seen, leading some people to believe that there is a face there, literally, the man or woman in the moon. (I, myself, see the woman with the necklace—shortly after the lunar disk passes full the crater Tycho shines best to the naked eye). The human eye is very good at spotting contrasts, but only gathers light for a few milliseconds. The objects in this group need no instrument - -Just find them with your very own peepers!

SAGITTARIUS GROUP

Investigate objects in the most exciting part of the sky, the galactic center of the Milky Way! The constellation of Sagittarius contains star clouds of the Milky Way galaxy, it is here that astronomers are studying the heart of the galaxy. The radio source Sagittarius A is believed by many to contain a supermassive black hole. You won't see that from your backyard, but you may see some of the many globular and open clusters that are packed into this small area of the sky. Don't miss some of the bright nebular clouds, such as the Lagoon and the Trifid that are on this list. It isn't necessary to know the names of all the objects that are located here. Just take your eyes, telescope or binoculars and look around.

ASTRA'S STAR GATE OBSERVING CHALLENGE
SOLAR SYSTEM GROUP Observation Report Form
Instructions: These objects must be observed with a telescope

NAME_____
Instrument_____

OBJECT	DATE	NOTES
SUN ☼	_____	_____
MOON		
Crater Plato	_____	_____
Juras Mountains	_____	_____
Straight Wall	_____	_____
Crater Copernicus	_____	_____
JUPITER		
N & S Equatorial Band	_____	_____
Red Spot	_____	_____
Galilean Satellites	_____	_____
Occultation/Transit	_____	_____
SATURN	_____	_____
Titan	_____	_____
VENUS	_____	_____
MARS	_____	_____
URANUS	_____	_____
NEPTUNE	_____	_____
EXTRA CREDIT		
COMET	_____	_____

ASTRA'S STAR GATE OBSERVING CHALLENGE Name_____

BINOCULAR GROUP Observation Report Form Instrument_____

OBJECT	**DATE**	**NOTES**
M 6 Star Cluster SCO	_____	_____
M 7 Star Cluster SCO	_____	_____
M 8 Nebula SGR LAGOON	_____	_____
M 17 Nebula SGR OMEGA	_____	_____
M 13 Globular Cluster HER	_____	_____
M 20 Nebula SGR TRIFID	_____	_____
M 22 Globular Cluster SGR	_____	_____
M 42 Nebula ORI	_____	_____
M 44 Star Cluster BEEHIVE	_____	_____
DOUBLE CLUSTER	_____	_____
ANDROMEDA GALAXY	_____	_____
M 45 PLEIADES	_____	_____
COMO STAR CLUSTER	_____	_____
SAGITTARIUS STAR CLOUD	_____	_____
SCUTUM STAR CLOUD	_____	_____
MOON		
COPERNICUS CRATER	_____	_____
MARE CRISIUM	_____	_____
EXTRA CREDIT		
IC 4756 Star Cluster OPH	_____	_____

ASTRA'S STAR GATE OBSERVING CHALLENGE NAME_____

NAKED EYE OBJECTS GROUP Observation Report Form

OBJECT	DATE	NOTES
Artifical Satellite	_____	_____
Meteor	_____	_____
The Teapot	_____	_____
The Milky Way	_____	_____
The Moon	_____	_____
Andromeda Galaxy	_____	_____
CONSTELLATIONS		
Cygnus	_____	_____
Leo	_____	_____
Hercules	_____	_____
Orion	_____	_____
Ursa Major	_____	_____
PLANETS		
Venus	_____	_____
Jupiter	_____	_____
Mars	_____	_____
Saturn	_____	_____
EXTRA CREDIT		
Rainbow	_____	_____

ASTRA'S STAR GATE OBSERVING CHALLENGE NAME_____

SAGITTARIUS GROUP Observation Report Form

Instructions: These objects must be observed with an instrument

OBJECT	DATE	NOTES
M 8 NEB TRIFID	_____	_____
M 17 NEB OMEGA	_____	_____
M 18 Star Cluster	_____	_____
M 20 NEB LAGOON	_____	_____
M 21 Star Cluster	_____	_____
M 22 Globular Cluster	_____	_____
M 23 Star Cluster	_____	_____
M 24 Star Cluster	_____	_____
M 25 Star Cluster	_____	_____
M 28 Globular Cluster	_____	_____
M 54 Globular Cluster	_____	_____
M 55 Globular Cluster	_____	_____
M 69 Globular Cluster	_____	_____
M 70 Globular Cluster	_____	_____
M 75 Globular Cluster	_____	_____

EXTRA CREDIT

Dark Nebula	_____	_____

ASTRA'S STAR GATE OBSERVING CHALLENGE NAME_____

GALAXIES GROUP Observation Report Form Instrument_____

Instructions: These objects must be observed with an instrument

OBJECT	**DATE**	**NOTES**
M 31 AND 3.4	_____	_____
M 32 AND 8.2	_____	_____
M 51 CVN 8.1	_____	_____
M 60 LEO 10.0	_____	_____
M 61 LEO 10.2	_____	_____
M 81 UMA 6.8	_____	_____
M 82 UMA 8.4	_____	_____
M 84 VIR 9.3	_____	_____
M 86 VIR 9.2	_____	_____
M 87 VIR 8.6	_____	_____
M 98 COM 10.1	_____	_____
M 99 COM 9.8	_____	_____
M 108 UMA 10.0	_____	_____
M 110 AND 8.0	_____	_____
NGC 253 SCL 8.9	_____	_____

EXTRA CREDIT

NGC 6946 CEP	_____	_____

ASTRA'S STAR GATE OBSERVING CHALLENGE NAME_____

STAR ASSOCIATIONS GROUP Observation Report Form Instrument_____

Instructions: These objects must be observed with an instrument

OBJECT	**DATE**	**NOTES**
M 10 Globular OPH	_____	_____
M 12 Globular OPH	_____	_____
M 13 Globular HER	_____	_____
M 53 Globular COM	_____	_____
NGC 6449 Globular SGR	_____	_____
M 11 Star Cluster SCT	_____	_____
M 35 Star Cluster GEM	_____	_____
M 38 Star Cluster AUR	_____	_____
M 103 Star Cluster CAS	_____	_____
NGC 1980 Star Cluster ORI	_____	_____
M 27 PN DUMBBELL	_____	_____
M 57 PN THE RING	_____	_____
Gamma Arietis DS	_____	_____
Alpha Libra DS	_____	_____
Epsilon Lyra DS	_____	_____
EXTRA CREDIT		
M 97 THE OWL	_____	_____

Coordinates for Objects in the Astra's Star Gate Observing Challenge

SAGITTARIUS GROUP

M #	NGC	#RA (2000)	Dec	Mag
86	5231	8 03.8	-24 23	5.8
16	6611	18 18.8	-13 47	6.0
17	6618	18 20.8	-16 11	7.0
18	6613	18 19.9	-17 08	6.9
20	6514	18 2.6	-23 02	8.5
21	6531	18 4.6	-22 30	5.9
22	6656	18 36.4	-23 54	5.1
23	6494	17 56.8	-19 01	5.5
24		18 18.5	-18 29	4.5
25		18 31.6	-19 15	5.6
28	6626	18 24.5	-24 52	6.9
54	6715	18 55.1	-30 29	7.7
55	6809	19 40.0	-30 58	7.0
69	6637	18 31.4	-32 21	7.7
70	6681	18 43.2	-32 18	8.1
75	6864	20 06.1	-21 55	8.6
	6440	17 48.9	-20 4	9.4
	6624	18 23.7	-30 4	8.5

GALAXIES GROUP

M	**NGC**	**RA(2000)**	**Dec**	**MAG**	
49	4472	12h 28m	+08 08	10.1	
58	4579	12h 36m	+11 57	11.0	
59	4621	12h 41m	+11 47	11.4	
60	4649	12h 42m	+11 41	10.6	
61	4303	12h 20m	+04 37	10.4	
84	4374	12h 24m	+13 02	10.9	
85	4382	12h 24m	+18 20	10.5	
86	4406	12h 25m	+13 05	10.9	
87	4486	12h 29m	+12 32	10.7	Virgo A
88	4501	12h 31m	+14 34	10.9	
89	4552	12h 34m	+12 42	11.3	
90	4569	12h 35m	+13 18	11.2	
91	4548	12h 34m	+14 38	11.9	
98	4192	12h 12m	+15 03	11.4	
99	4254	12h 17m	+14 34	10.5	
100	4321	12h 21m	+15 58	10.8	
104	4594	12h 40	-11 37	8.3	Sombrero Galaxy
	4565	12h 36.3	+25.59	9.6	
	4261	12h 19.3	+05.49	11.5	

Source:M Objects:Observer's Handbook 1992
NGC Objects:1000+ Database

Astra's Star Gate

Celestial Challenge Observing Program

This Certificate of Excellence is granted to:

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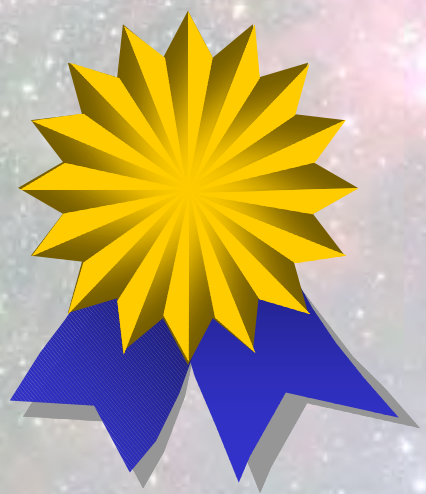
for Viewing of all Celestial Objects of the Observation Challenge



Completion Date: _____

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Dawn Jenkins, Observations Director
Astra's Star Gate