

# AMATEUR OBSERVERS' SOCIETY

## INTRODUCTION TO ASTRONOMY

### OBSERVING PROGRAM

#### **Introduction**

When you go out at night to observe the sky, whether with the help of a telescope, a pair of binoculars, or simply using the unaided eye, you can enjoy many sights. However, sometimes this experience can be enriched if one has a specific list of objects to observe. This gives you a goal to try to achieve, as well as a sense of accomplishment afterwards, even if only a portion of the planned observing list for any single evening is completed. To enhance your observing experience as well as to help you learn more about the night sky and all of its wonders, the AOS has developed the **Beginners' Observing Program**.

No purchase of equipment is needed to participate in this program. Many activities involve the unaided eye, and if equipment is needed, the Club telescope or binoculars, as well as sky charts and lunar maps are available. In addition, more experienced club members will be happy to assist you in finding any sky object.

All of the observations and activities on this list can be done during the evening hours. Having a goal and a purpose ahead of you when you go out at night to observe the sky will increase your enjoyment as you learn more astronomy!

#### **Certificate Award**

In order to qualify for an **AOS Beginner Observer Certificate** award, you need to keep a log of your observations. This will be simple to do, since an observation sheet is provided. As you make your observations, you simply fill in the necessary information, such as the name of the object, a brief description of its appearance, the instrument used (if any), and the location, date, and time. As you progress in filling out your log sheet, you will gain an increasing sense of accomplishment while you become a more skillful and experienced observer and telescope operator.

#### **Let's Get Started!**

Don't hesitate to ask for assistance to complete this program. If possible, come down to Robert Moses State Park during observing nights to observe with others. You'll have a great time getting to know more AOS members while you complete the program. Good luck!

## **1. UNAIDED EYE OBJECTS**

- a. Observe **any 4 constellations**. Sketch each constellation and write a brief description.
- b. Observe the **Moon** on 3 different dates during one cycle of phases and sketch its appearance. New Moon dates are given on most calendars, and the cycle lasts about 29 days.
- c. Observe **any 3** of the following **Lunar Maria** (the dark areas of the Moon). (Binoculars may be used if needed.) The number of days in parentheses refers to the number of days after New Moon when the object is best viewed.

Mare Crisium (4-16 days)

Mare Serenitatis (7-17 days)

Mare Tranquillitatis (7-17 days)

Mare Imbrium (10-18 days)

Mare Nubium (10-18 days)

Mare Fecunditatis (4-16)

- d. Observe **any 6** of the following bright **stars**.

Alcor and Mizar (Ursa Major)

Capella (Auriga)

Regulus (Leo)

Aldebaran (Taurus)

Castor (Gemini)

Rigel (Orion)

Altair (Aquila)

Deneb (Cygnus)

Sirius (Canis Major)

Antares (Scorpius)

Polaris (Ursa Minor)

Spica (Virgo)

Arcturus (Bootes)

Pollux (Gemini)

Vega (Lyra)

Belegeuse (Orion)

Procyon (Canis Major)

## **2. BINOCULAR OBJECTS**

- a. Observe **any 3** of the following **lunar craters** (A telescope can be used if needed.)

Plato (about 10 days)

Archimedes (about 10 days)

Copernicus (about 10 days)

Eratosthenes (about 10 days)

Aristoteles (about 7 days)

Eudoxus (about 7 days)

- b. Observe **any 1** of the following **deep-sky objects** (mostly Messier objects).

A telescope may be used if binoculars are not available.

**M45** (Pleiades star cluster in Taurus)

**M44** (Beehive star cluster in Cancer)

**M8** (Lagoon Nebula in Sagittarius, a gas cloud and a star cluster)

**M13** (star cluster in Hercules)

## **3. TELESCOPE OBJECTS AND SKILLS**

- a. Observe **at least 1** planet and sketch its appearance. If a telescope is not available, use binoculars to observe Jupiter and its Moons.

b. Locate **any 3** of the following stars in a telescope. (A "go to" telescope may be used.) Vega, Antares, Aldebaran, Betelgeuse, Capella, Rigel, Sirius, Polaris, Arcturus, Altair, Spica, Regulus.

- c. Locate **any 2** double stars. (A "go to" telescope may be used.)

Examples: Epsilon Lyrae (a double-double, with each star having a separate companion visible in a telescope), Mizar in Ursa Major, Regulus in Leo, Albireo (beta Cygni), Castor (alpha Geminorum), eta Cassiopeiae, and alpha Capricornus (another double-double).

- d. Locate and sketch **any 3** of the following deep-sky objects.

**M31** (Andromeda Galaxy)

**M11** (Wild Duck cluster in Scutum)

**M13** (star cluster in Hercules)

**M8** (Lagoon Nebula in Sagittarius)

**M57** (ring nebula in Lyra)

**Double Cluster** in Perseus

**M42** (Orion Nebula)

**M22** (star cluster in Sagittarius)

**M 27** (Dumbbell Nebula in Vulpecula)

**M44** (Beehive Cluster in Cancer)

## **4. REACHING OUT TO THE COMMUNITY**

Perform **one** of the following.

- a. Point out a sky feature (such as a constellation) to a person unfamiliar with the sky.
- b. Discuss the issue of light pollution with someone.
- c. Other activity of your choice.

**AMATEUR OBSERVERS' SOCIETY**  
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**RECORDING CHARTS**

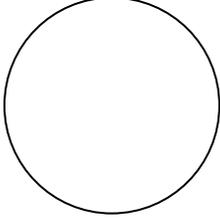
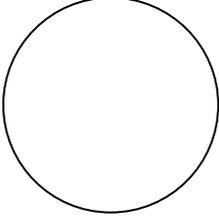
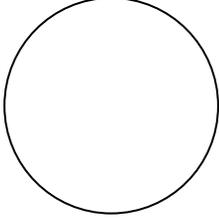
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**1. UNAIDED EYE OBJECTS**

**a. Constellations (unaided eye)**

Constellation _____          description _____ _____ date _____ time _____ location _____	Constellation _____          description _____ _____ date _____ time _____ location _____
Constellation _____          description _____ _____ date _____ time _____ location _____	Constellation _____          description _____ _____ date _____ time _____ location _____

**b. Whole Moon Observations (unaided eye)**

1 <sup>st</sup> Observation	2 <sup>nd</sup> Observation	3 <sup>rd</sup> Observation
		
date _____ time _____	date _____ time _____	date _____ time _____
location _____	location _____	location _____

**c. Lunar Maria (unaided eye or binoculars)**

Mare Name	date	time	location	equipment used
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

**d. Bright Stars (unaided eye)**

Star Name	date	time	location
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

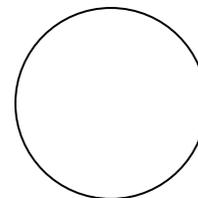
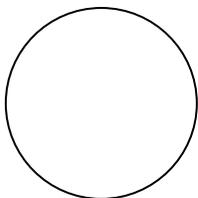
**2. BINOCULAR OBJECTS**

**a. Lunar Craters (binoculars or telescope)**

Crater Name	date	time	location	equipment used
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

**b. Deep-Sky Objects (binoculars or telescope)**

Object Name and/or Messier Number	date	time	location	equipment used
_____	_____	_____	_____	_____



**3. TELESCOPE OBJECTS AND SKILLS**

**a. Planets (at least one)**

Planet Name _____	Planet Name _____	Planet Name _____
date _____ time _____	date _____ time _____	date _____ time _____
location _____	location _____	location _____
equipment used _____	equipment used _____	equipment used _____

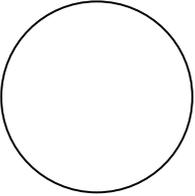
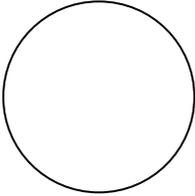
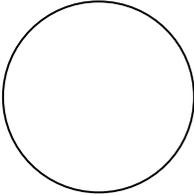
**b. Locating Stars in a telescope:**

Star Name	date	time	location	equipment used
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

**c. Double Stars in a Telescope:**

Star	date	time	location	equipment used
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

**d. Deep-sky Objects in a telescope:**

Object Name _____	Object Name _____	Object Name _____
		
Date _____ time _____	Date _____ time _____	Date _____ time _____
Location _____	Location _____	Location _____
Equipment used _____	Equipment used _____	Equipment used _____

**4. REACHING OUT**

Description of activity \_\_\_\_\_

Name of person(s) with whom you interacted \_\_\_\_\_

date \_\_\_\_\_ time \_\_\_\_\_