

# Astronomical League

## Mars Observing Program

### Requirements

#### General:

- Observations may be sketches or images.
- A single observation can be used for more than one purpose. For example, you can observe blue clearing, polar caps, and albedo features in a single observation, and it will count toward each requirement.
- All observations must be on the ALPO Report Form.
- Images have the same requirements as sketches for additional information.
- All observations must include observing notes, including:
  - Observer name and location (country and province are enough).
  - Observer contact information (usually, email address).
  - Date and time (or range of time), in Universal Time not local time.
  - Telescope aperture and type.
  - Magnification for drawings, focal length or focal ratio for images.
  - Filters used.
  - For images, the camera brand or type, and specify monochromatic or color.
  - Seeing, judged on either the 0-10 Pickering scale or the V-I scale of Antoniadi.
  - Transparency, judged as the faintest star magnitude visible to the unaided eye in the region of sky in which Mars is located (1-6).
  - "CM" is central meridian, and it is important that you record this in order to complete the requirements of this project.
  - Blue clearing can be left out sometimes but note that a number of estimates of blue clearing are necessary to complete the requirements of this award.
  - The DE, DS, LS, and k (illumination percent) are of interest to serious Mars observers, but they are not required for this award. However, if you choose to look them up, and understand them, you will be demonstrating to your own satisfaction that you are a serious observer!
  - Directions on the drawing or image must be indicated unambiguously. See the advice about this in the article, "How to use the A.L.P.O. Mars Section observing form", located on the A.L.P.O. website.
  - Phase effect depictions with N-S axis vertical: evident in at least 4 of the observations.

## Specific Observations Required:

1. The appearance of Mars (8 or more observations):
  - Make a number of observations such that every longitude is depicted at least twice while it is within 45 degrees of the central meridian. This will acquaint you with the planet better than any other aspect of this program. (To keep track of which meridians you've drawn, you can make a ranked list of the central meridians of each of your observations, and then list beside them the longitudes that are 45 degrees preceding and 45 degrees following the CM's. A plot of these numbers versus rank will give you a visual impression of the gaps in meridional ranges that you need to cover better. The use of a spreadsheet or a word processing program to keep such a ranked record will make this easy.)
  
2. Polar caps (4 or more observations):
  - Make 4 drawings or images showing a polar cap during the time of its seasonal regression, to show the progression of the decrease in size. Include the following:
    - Measure the diameters, convert to degrees of latitude, and draw a graph.
    - Note any phase effect, which introduces error in the measurement.
    - Draw or image the edge of the receding cap x4, with note of dark collar if present. Explanatory notes are required.
    - Describe or draw or image clouds around the edge of receding cap, or lack thereof. Explanatory notes are required.
  - Late in course of the cap recession, draw cap outliers at least once. You need to know in advance when they can be seen.
  
3. Clouds (6 or more observations):
  - Observe and describe morning limb or morning terminator clouds twice.
  - Observe a white cloud twice, located away from morning limb and away from the polar caps, with description. Orographic clouds are good candidates for the meeting of this requirement. (Find them in blue light!)
  - Identify and observe one dust storm, with one drawing or image. Pay attention to blogs to find when one is present! If you have not yet familiarized yourself with albedo features in the area of the dust storm, draw what you see, and revisit the area after the resolution of the storm to make a comparison observation.

4. Blue clearing (4 or more observations):

- Using a dense blue filter such as W47 or W44, estimate the relative visibilities of albedo features, looking for variability in this characteristic (blue clearing). If no blue clearing is detected record 4 estimates in which you state it so.

5. Albedo feature monitoring (16 or more total observations):

- Disc drawings or images spaced at least 30 days apart, concentrating on possible changes in the appearance of each of the following features, 4 drawings or images of each feature:
  - Syrtis Major and Hellas together
  - Margaritifer Sinus and Mare Acidalium together
  - Solis Lacus
  - Elysium
- These may do double duty with other requirements, but note that the changes over time are emphasized with this exercise.