Mars Observing Program

Mars Observing Program Coordinator:

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Introduction

Welcome to the Mars Observing Program of the Astronomical League. Participation in this program will enhance your observing skills, and upon its completion you will have contributed scientific observations which will be available to those who can use them for scientific analysis. Mars is fascinating to observe, and the sense of personal accomplishment in observing it can be great.

Although NASA space probes have uncovered a great deal of information about Mars, many uncertainties still exist regarding the visible phenomena of the Martian surface and atmosphere. For example, why do the maria appear to darken when the polar caps melt? What causes the mysterious "blue clearing"? Are there identifiable atmospheric phenomena that lead to the development of dust storms? What is causing the slow, year to year changes in the dark albedo features? Spacecraft thus far have provided little additional knowledge of these phenomena, and have even found new Martian mysteries. Our desire to study the Red Planet is enhanced rather than diminished by the findings of spacecraft.

Quick View of Requirements Mars Observing Program	
Uses Eyes	
Uses Binoculars	
Uses Telescopes	Yes
Must be an AL Member	Yes
Date Deadline for Submission	
Minimum Instrument Size	
Manual Observations Required	
Go-To Telescopes Allowed	Yes
Remote Telescopes Allowed	Yes
Number of Observations	
Option for Imaging	Yes
Special Equipment Required	Yes
Equipment Must Be Constructed	
Observations Must Be Submitted to an On-Line Database	Yes

About every 2 years and 50 days, Mars comes into opposition with the Earth. Due to the eccentricity of Mars's orbit, there is much variation in the apparent size of Mars from one

opposition to the next. The closest oppositions occur in a cycle of about 16 years. At closest approach in 2003, Mars appeared the largest in recorded history, reaching a diameter of more than 25 arc seconds. In contrast, the unfavorable oppositions of 2010 and 2012 yielded maximum apparent diameters of only about 14 arc seconds. Observers have long considered an apparent size of 6 arc seconds or larger to allow useful observations of the planet. This size constraint typically allows about 5 months of good observing before opposition, and an equal length of time after opposition. This 10-month period is when we can observe its surface, its atmospheric clouds and hazes, and its brilliant white polar caps.

The period from one opposition to the next is called an apparition, and the apparition is usually named by the year in which the opposition occurs. For example, the "2018 apparition" lasts from July 2017 to September 2019.

Although one might naturally think that the closest apparitions are the most interesting ones to observe, many long-time observers find that the more distant apparitions are more interesting. This preference is due to two things. First, during more distant apparitions, Mars stays at a northern declination during the best observing months, while during the close apparitions the best months occur when Mars is far south of the celestial equator and low in the sky for Earthlings in the Northern Hemisphere. Second, Mars exhibits more cloud features during the more distant parts of its orbit, so that it is more interesting to monitor. So, do not allow the closeness of the apparition determine whether you will observe Mars.

Observing Program Requirements

Mars invites everyone to study it, but to receive this observing award you must be a member of the Astronomical League, either through membership in an affiliated astronomical society or a Member-At-Large.

Observations that the amateur astronomer can pursue are needed in order to improve our understanding of Mars. By completing these award requirements, an astronomer will have contributed meaningfully to the ongoing monitoring of the Red Planet in which the A.L.P.O. is involved. To satisfy the requirements of this program, participants must make observations spread among each of these three areas of study:

1. Studies of the Martian Polar Regions and the two polar caps,
2. Examining Martian atmospheric phenomena: clouds and dust storms and blue clearing, and
3. Observation of the major albedo features at all longitudes.

Detailed requirements under each area of study are specified on the Observing Requirements document. Randomly timed observations are likely to be quite inefficient in completing the requirements for the award. The observer should study the apparition before it begins or early in its course, and plan a series of observations by which the requirements can be met.

For example, the shrinkage of either polar cap over a number of months might be missed if one does not plan to observe during the part of the apparition during which it occurs. The side of Mars facing you will be displayed in a number of different planetarium (star chart) programs for

your computer or smart phone. Alternatively, you can use the "Mars Profiler" on the Sky & Telescope website: from the home page, click on "OBSERVING" in the heading, and in the drop-down list choose "INTERACTIVE TOOLS." In the resulting detailed menu, scroll down until you find "Mars Profiler." Or, just go to: http://www.skyandtelescope.com/observing/interactive-sky-watching-tools/mars-which-side-is-visible/ .

The program may be achieved in a single apparition, but this is not required. The observations of the shrinkage of a polar cap must be completed in a single apparition. Observations extending into a second apparition can be accepted, provided that the polar cap observations are in a single apparition. The Astronomical League Coordinator who reviews the observations will have final authority in determining whether an observer's submissions are sufficient for him to receive the award.

"Negative observations" are valuable -- but the observer will be required to document negative observations in the same fashion that he documents positive observation of each phenomenon for which he is looking (e.g., clouds, dust storms, blue clearing). These can be combined with observations of albedo features and polar caps, so that the observer will not feel that he or she is wasting time by making repeatedly negative observations. It is expected that an observer will include on the same report form his observations of such features as polar caps, clouds, albedo features, and blue clearing, all of which might be observed on a single night.

The Awards

The program offers two versions: a visual option and an imaging option. You must meet all of the requirements as outlined on the requirements page. A certificate and pin is awarded to those completing the requirements of the program and it will indicate the option done.

Rules and Regulations

You must be a member of the Astronomical League, either through membership in an affiliated astronomical society or as a Member-at-Large.

Remote telescopes may be used as long as the submitter is responsible for directing the telescope.

Observation Requirements	
Mars Observing Program	
Object Name/Number	Yes
Observer's Latitude	Yes
Observer's Longitude	Yes
Observer's Location (City)	
Observer's Altitude	
Date of Observation (LT or UT)	Yes
Time of Observation (LT or UT)	Yes
Description of Object	Yes
Sketch of Object	Yes
Seeing	Yes
Transparency	Yes
Sky Conditions	
Size of Instrument Used	Yes
Power/Magnification	Yes
Filters Used	Yes

Participants are required to record their observations, including sketches, on the observing form used by the Mars Section of the Association of Lunar and Planetary Observers (A.L.P.O.). These completed forms should be scanned or copied.

Submitting for Certification

After you have completed the required observations they should be scanned or copied. The copies should be sent to the Coordinator of the Mars Section of A.L.P.O. as well as the Astronomical League Coordinator. Do NOT send the original logs, they will not be returned. The certificate and pin will be sent once the information is confirmed.

The submission should include a completed Submission Form.

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A.L. Mars Observing Program Coordinator:

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Submission Requirements	
Mars Observing Program	
Observer's Name	Yes
Obsever's Mailing Address	Yes
Observer's Club Affiliation	Yes
Observer's Phone Number	Yes
Observer's E-Mail Address	Yes
Information for Person to Send the Award To For Presentation	Yes