

Read the General Rules in the manuals and on [www.soinc.org](http://www.soinc.org) as they apply to every event.

1. **DESCRIPTION:** Students will demonstrate an understanding and basic knowledge of the properties and evolution of stars, open clusters and globular clusters, and normal and star-forming galaxies.

**A TEAM OF UP TO:** 2

**APPROXIMATE TIME:** 50 Minutes

2. **EVENT PARAMETERS:** Each team may bring only two 8.5" x 11" two-sided pages of notes containing information in any form from any source and must provide their own clipboards and red-filtered flashlights.

3. **THE COMPETITION:** This event is divided into two parts. Notes may be used during both parts.

- a. **Part I:** Participants may be asked to identify the stars, constellations, and deep sky objects included in the lists below as they appear on star charts, H-R diagrams, portable star labs, photos, or planetariums, and must be knowledgeable about the evolutionary stages of all stars and deep sky objects on the list below. Note: Constellations are underlined; **Stars** are boldface; *Deep Sky Objects* are italicized.

Andromeda: *M31 Andromeda Galaxy*

Aquila: **Altair**

Auriga: **Capella**

Bootes: **Arcturus**

Cancer: *M44 Beehive Cluster*

Canes Venatica: *M51 Whirlpool Galaxy*

Canis Major: **Sirius**

Canis Minor: **Procyon**

Centaurus: **Proxima Centauri**

Cetus: **Mira**

Cassiopeia: *Cas A & Tycho's Star*

Cygnus: **Deneb**

Dorado: *LMC*

Gemini: **Castor & Pollux**

Libra: **Gliese 581**

Hercules: *M13 Globular Cluster*

Leo: **Regulus**

Lyra: **Vega & M57 Ring Nebula**

Mensa: *LMC*

Orion: **Betelgeuse, Rigel & M42 Orion Nebula**

Perseus: **Algol**

Sagittarius: *Sgr A*

Scorpius: **Antares**

Taurus: **Aldebaran, Hyades Star Cluster,**

*M1 Crab Nebula & M45 Pleiades*

Tucana: *SMC*

Ursa Minor: **Polaris**

Ursa Major: **Mizar & Alcor**

Virgo: **Spica**

Also the Milky Way Galaxy

- b. **Part II:** Participants will be asked to complete one or more hands-on or interpretive tasks selected from the following topics:

- i. Spectral classification of stars
- ii. Stellar evolution
- iii. Open and globular clusters
- iv. Galactic types and structure



4. **SAMPLE PERFORMANCE TASKS:**

- a. Given the properties and/or spectra of stars and deep sky objects, participants will identify their proper placement on an H-R Diagram.
- b. Given a sequence of evolutionary stages for sun-sized and massive stars - red giant, red supergiant, planetary nebula, white dwarf, type Ia and type II supernovae, neutron stars and black holes - participants will match a set of images in the correct sequence.

5. **SCORING:** Each task and/or question will have been assigned a predetermined number of points. Places determined by total number of points. Ties will be broken by the accuracy and thoroughness of responses.

**Recommended Resources:** All reference and training resources including the **Audubon Field Guide to the Night Sky** and the **Bio/Earth CD** are available on the Official Science Olympiad Store or Website at <http://www.soinc.org>

Examples:

who is  
Charles Messier?

pg 2

Star Map

Photographic Images

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part 1 more than just  
identify —

part 2 { what is it —  
what happened —  
break it down piece at a time —  
where is it going —

recommend: to study:

internet

in-house planetarium

planet-sphere

google-sky maps app for phone