REACH FOR THE STARS

See General Rules, Eye Protection & other Policies on www.soinc.org as they apply to every event.

1. **DESCRIPTION**: Students will demonstrate an understanding of the properties and evolution of stars **especially star forming regions and supernova remnants** and their observation with different portions of the electromagnetic spectrum: Radio, Infrared, Visible, Ultraviolet, X-Ray and Gamma Ray.

   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 information in any form from any source and **may be asked to provide 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.

      Aquila: **Altair,** *W49 region*
      Aquarius: *NGC 7293, Helix Nebula*
      Auriga: **Capella**
      Bootes: **Arcturus**
      Canis Major: **Sirius**
      Canis Minor: **Procyon**
      Carina: *NGC3603, NGC3372*
      Cassiopeia: *Cas A, Tycho's SNR, NGC 281, W3 Main*
      Dorado: *30 Doradus, LMC*
      Cygnus: **Deneb,** *Cygnus X-1*
      Gemini: **Castor** & **Pollux**
      Hydrus: *NGC 602*

      Leo: **Regulus**
      Lyra: **Vega**
      Monoceros: *Rosette Nebula*
      Ophiuchus: **Zeta Ophiuchi**, *Kepler SNR*
      Orion: **Betelgeuse**, **Rigel** & *M42 Orion Nebula*
      Perseus: **Algol**
      Sagittarius: *Sgr A*, M17, M8*
      Scorpius: **Antares**
      Taurus: **Aldebaran**, *M1 Crab Nebula*
      Ursa Minor: **Polaris**
      Ursa Major: **Mizar** & **Alcor**
      Virgo: **Spica**

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

      i. Stellar evolution
      ii. Spectral classification of stars
      iii. Observation using multiple portions of the electromagnetic spectrum
      iv. The relationship between stellar temperature, radius, and luminosity
      v. **Magnitude and luminosity scales, distance modulus, inverse square law**

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 set of images observing a star or deep space object with different portions of the electromagnetic spectrum, identify which images correspond to which portion of the spectrum and describe what features are prominent in each observation and why.

5. **SCORING**: Each task and/or question will have been assigned a predetermined number of points. High score wins. 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 Also See: http://chandra.harvard.edu/, http://www.nrao.edu/, aavso.org, http://www.stsci.edu/hst/, http://www.spitzer.caltech.edu/

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