



ASTRONOMY

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

1. **DESCRIPTION:** Teams will demonstrate an understanding of stellar evolution and **Type Ia supernova** events.

A TEAM OF UP TO: 2

APPROXIMATE TIME: 50 minutes

2. **EVENT PARAMETERS:** Each team may bring either two computers (of any kind) or two 3-ring binders (any size) containing information in any form from any source, or one binder and one computer. The materials must be inserted into the rings (notebook sleeves are permitted). Each team member is permitted to bring a programmable calculator.
3. **THE COMPETITION:** Using information which may include Hertzsprung-Russell diagrams, spectra, light curves, motions, cosmological distance equations and relationships, stellar magnitudes and classification, multi-wavelength images (X-ray, UV, optical, IR, radio), charts graphs and **DS9/JS9 imaging analysis software**, teams will complete activities and answer questions related to:
 - a. Stellar evolution, including **stellar classification**, spectral features and chemical composition, luminosity, blackbody radiation, color index and H-R diagram transitions, **red giants, white dwarfs (oxygen & helium), neutron stars, planetary nebulas, accretion disks, Type Ia supernovas, dwarf novas, AM CVn systems, Mira variable Stars, globular clusters.**
 - b. Use Kepler's laws of rotation and circular motion to answer questions relating to the orbital motions of **binary systems**; use parallax, spectroscopic parallax, the distance modulus and **Hubble's law to calculate distances to Type Ia supernovas.**
 - c. Identify and answer questions relating to the content areas outlined above for the following objects: **J075141/J174140, NGC 2392, SNR 0509-67.5, Omicron Ceti, SN 2011fe, SNR G1.9+0.3, NGC 2440, Henize 2-248, Henize 3-1357 (Stingray Nebula), Tycho's SNR, SS Cygni, M15, HM Cancri, Sirius A & B, NGC 1846.**
4. **SCORING:** All questions will have been assigned a predetermined number of points. The highest score wins. Selected questions will be used to break ties.

Recommended Resources: All reference and training resources including the **Astronomy CD** are available on the Official Science Olympiad Store or Website at www.soinc.org, chandra.harvard.edu/photo/index.html; www.stsci.edu/hst/; apod.nasa.gov/apod/astropix.html; public.nrao.edu/; www.spitzer.caltech.edu/

THIS EVENT IS SUPPORTED BY:

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