Southern Utah University Practical Guide to
Science Olympiad REACH FOR THE STARS Division B Event 2020

Disclaimer: *The information in this guide is designed to provide a helpful breakdown of the Science Olympiad Event Manual. This guide is not meant to replace the official Science Olympiad Event Manual. Rather, it is intended to aid user comprehension of the official manual. Event staff and competitors are responsible for familiarizing themselves with the official Science Olympiad Event Manual and event manual updates prior to the SUU Science Olympiad. The SUU Science Olympiad will defer to the official Science Olympiad Event Manual and event updates during competition.*

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

DESCRIPTION:
Students will demonstrate an understanding of the properties and evolution of stars and galaxies as well as their observation using different portions of the electromagnetic spectrum (e.g., Radio, Infrared, Visible, Ultraviolet, X-Ray, Gamma Ray).

A TEAM OF UP TO: 2   **APPROXIMATE TIME**: 50 minutes

EVENT PARAMETERS:

1. Each team may bring

   a. two 8.5" x 11" sheets of paper, which may be in sheet protectors sealed by tape or laminated, that may contain information on both sides in any form and from any source without any annotations or labels affixed.

   b. Two non-programmable, non-graphing calculators

   c. Two clipboards

   d. Two red-filtered flashlights.

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

Part I: Written Exam

1. 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.

Constellations	Stars	Deep Sky Objects
Andromeda		M31 (Andromeda Galaxy)
Aquila	Altair	
Auriga	Capella	
Bootes	Arcturus	
Canis Major	Sirius	
Canis Minor	Procyon	
Centaurus		NGC5128
Coma Berenices		NGC4676, NGC4555
Corvus		NGC4038/NGC4039
Crux		Dragonfish Nebula
Cygnus	Deneb	
Dorado		30 Doradus, LMC
Gemini	Castor, Pollux	
Lyra	Vega	
Ophiuchus	Zeta Ophiuchi	Rho Ophiuchi cloud complex
Orion	Betelgeuse, Rigel	M42 (Orion Nebula)
Perseus	Algol	NGC1333

Sagittarius		Sgr A*, M8 (Lagoon Nebula)
Sextans		Baby Boom Galaxy
Scorpius	Antares	NGC6357, NGC6334
Taurus	Aldebaran	T Tauri
Tucana		SMC
Ursa Major	Mizar, Alcor	GN-z11, M101
Ursa Minor	Polaris	
Virgo	Spica	M60, M104

Part II: Hands-on or Interpretive Task

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

   a. Stellar and galactic evolution

   b. Spectral classification of stars

   c. Hubble classification of galaxies

   d. Observation using multiple portions of the electromagnetic spectrum

   e. The relationship between stellar temperature, radius, and luminosity

   f. Magnitude and luminosity scales, distance modulus, inverse square law

SAMPLE PERFORMANCE TASKS:

1. Given the properties and/or spectra of stars and deep sky objects,participants will identify their proper placement on an H-R Diagram.

2. 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.

SCORING:
1. High score wins. Each task and/or question will have been assigned a predetermined number of points.

2. Ties will be broken by the accuracy and thoroughness of responses.

Official Science Olympiad Recommended Resources: The Science Olympiad Store (store.soinc.org) carries the *Audubon Field Guide* to the Night Sky and the Bio/Earth CD; other resources are on the event page at soinc.org.

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