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Astronomy/DSOs

The Astronomy DSO list specifies which Deep Space Objects may be covered in the Astronomy event that year, and tend to reflect the topic of the event for the specific year in some form. It is typically listed in section 3.c of the rules. The DSO list is sometimes similar to the DSO list of the Division B event Reach for the Stars.

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General Tips

The DSO list can seem daunting at first. A good strategy for learning them is to take personalized notes from various sources while including images for identification.

- Categorize the DSOs by their types or stages in stellar evolution (e.g. Brown Dwarfs, Red Giants, White Dwarfs, Cepheid Variables, Supernova remnants, Globular Clusters). Take notes on each of these stages, as well as what makes them significant in the study of astronomy.
  - For example - a Type Ia Supernova can either be the result of collision of two white dwarfs or accretion of matter from a stellar companion (often reaching the Red Giant stage), and its mostly uniform brightness can help astronomers determine distance to distant galaxies using the distance modulus.
- For each DSO, take notes on what makes it unique and significant. The Chandra X-ray Observatory (https://www.youtube.com/user/cxcpub/videos) posts videos at the start of the competition season that briefly explain each object's significance. The Chandra photo album (http://chandra.harvard.edu/photo/) and NASA's APOD (https://apod.nasa.gov/apod/astropix.html) are also good resources for images and information on DSOs. For Variable stars, AAVSO (https://www.aavso.org/) is a helpful resource.
- Find photos (and light curves for variable stars) of the Deep Space Objects, as many as possible and across all wavelengths. Almost all tests include tasks to identify DSOs based on images or find all images of a certain DSO/category, and more difficult tests sometimes include more obscure images of the DSOs. Include the wavelength of light a certain image was taken in.
- Take notes on miscellaneous information about each DSO, including, but not limited to: constellation, alternate names, magnitude, stellar classification, right ascension/declination, and color index.
- Take practice tests. They can help reveal weaknesses in any notes on Deep Space Objects.
- If certain information about a DSO is given (such as the the masses and the separation of the binary system), calculate the period. Use information in any pre-existing notes to calculate other values before the test, saving valuable time.

2022 DSOs

2022 DSOs

Name	Images		Constellation	Magnitude		Distance	Coordinates		External Links
				Apparent	Absolute		Right Ascension	Declination	
HOPS 383			Orion			1,400 ly (420 pc)	5h 35m 29.81s	−4° 59′ 51.1″	Chandra (https://chandra.harvard.edu/photo/2020/hops383/more.html)
	HOPS 383 is a protostar surrounded by a shell of dust. In December 2017, the young protostar underwent an X-Ray flare.								
HH 24-26			Orion			1300 ly	05h 46m 07.34s	−00° 13′ 31.3″	APOD (https://apod.nasa.gov/apod/ap180311.html)
	HH24-26 is a molecular cloud and star-forming region that contains the Herbig-Haro objects HH 24, HH 25, and HH 26 originating from three protostars, as well as a very high concentration of jets.								
V1331 Cyg			Cygnus			1800 ly	21h 01m 09.210s	+50° 21′ 44.77″	phys.org (https://phys.org/news/2016-04-young-star-v1331-cygni-unveils.html)
	V1331 Cyg is a young star surrounded by an interesting ring-shaped structure, with an interesting missing arc from the ring.								
			Serpens				18h 29m	+01° 14′	NASA (https://www.nasa.gov/feature/goddard/

HBC 672			Cauda				56.88s	46.34″	2020/hubble-sees-cosmic-flapping-bat-shadow/)
			HBC 672 is a young star surrounded by a planet-forming disk that is moving and warping. The warping may be caused by a planet pulling on the disk.						
Orion Nebula			Orion	+4.0		1,344 ly	05h 35m 17.3s	−05° 23′ 28″	Chandra (https://chandra.harvard.edu/photo/2007/orion/) Hubble (https://hubblesite.org/contents/media/images/3866-Image)
			The Orion Nebula is a star-forming region in Orion.						
Alpha Tauri (Aldebaran)			Taurus			65 ly	04h 35m 55.24s	+16° 30′ 33.49″	
			Alpha Tauri is a K5 star on the red giant branch and is a slow irregular variable of type Lb.						
RR Lyrae			Lyra			841 ly	19h 25m 27.91s	+42° 47′ 03.69″	
			RR Lyrae is a low-mass Population II variable star and is the prototype star for the RR Lyrae class of variables.						
Omicron Ceti (Mira)			Cetus				02h 19m 20.79s	-02° 58′ 39.50″	
			Omicron Ceti is a binary star system consisting of Mira A, a red giant on the asymptotic giant branch and the prototype star for the Mira class of variables, and Mira B, a white dwarf.						
ESO 577-24			Virgo			1400 ly	13h 40m 41.35s	-19° 52′ 55.32″	
			ESO 577-24 is a planetary nebula surrounding the white dwarf Abell 36.						
IC 4593			Hercules			7800 ly	16h 11m 44.55s	+12° 04′ 17.03″	
			IC 4593 is a planetary nebula with a central bubble of ultra-hot gas at a temperature above 1 million K and a central point X-ray source.						
U Antliae			Antlia			910 ly	10h 35m 12.85s	-39° 33′ 45.32″	
			U Antliae is a carbon star and red giant on the asymptotic giant branch surrounded by large shells of dust.						
LP 40-365			Ursa Minor			2061 ly (632 pc)	14h 06m 35.42s	+74° 18′ 58.01″	
			LP 40-365, also known as GD 492, is a white dwarf composed almost entirely of metals that is thought to be the core remnant of a star that has gone supernova. It is moving extremely quickly and will likely escape the Milky Way altogether.						
ASASSN-16oh			Hydrus			200,000 ly	01h 57m 43.80s	-73° 37′ 32.39″	
			ASASSN-16oh is a binary system with a white dwarf accreting mass at the highest rate ever observed, causing it to release "supersoft" X-rays.						
V Sagittae			Sagittarius			7800 ly	20h 20m 14.69s	+21° 06′ 10.44″	
			V Sagittae is a binary system consisting of a main sequence star and a white dwarf. The system has brightened significantly in the past century and is expected to go supernova around the year 2083.						
AR Scorpii			Scorpius			380 ly	16h 21m 47.28s	-22° 53′ 10.39″	
			AR Scorpii is a binary pulsar exhibiting strong variations in optical, ultraviolet, and radio wavelengths (a first for a white dwarf), caused when the pulsar's beam sweeps across its partner red dwarf and the energy is re-emitted.						
SDSS 1035+0551			Sextans				10h 35m 33.02s	+05° 51′ 58.35″	SIMBAD (http://simbad.u-strasbg.fr/simbad/sim-id?Ident=SDSS+J103533.03%2B055158.4&submit=submit+id)
			SDSS 1035+0551 is a "dead cataclysmic variable," a binary system consisting of a white dwarf accreting mass from a substellar brown dwarf. These systems are thought to be common, but this is the first definite detection of one.						
Tycho's SNR			Cassiopeia				00h 25m 21.5s	+64° 08′ 27″	
			Tycho's SNR is a Type Ia supernova remnant from a supernova observed in 1572 that was caused by a white dwarf accreting mass from its companion red giant.						

Previous DSO Lists

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See Also

Astronomy
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Astronomy/Star and Planet Formation
Astronomy/Type Ia Supernovae
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Astronomy/Exoplanets

Links

Basic note sheet (http://scioly.org/wiki/images/8/88/DSO.docx) for the 2011 DSOs
SIMBAD Astronomy Database for DSOs (http://simbad.u-strasbg.fr/simbad/sim-fid)