

Please note that although suggested answers are provided here, they may not be fully accurate. Sorry for the troubles

Team Round

GALACSY

# Rules

- In this round, a team is to select a question from a list of questions.
- They will be marked within a scale of +20 and -10
- If they are unable to answer the question correctly, they are allowed to “throw” the question at an opposing team.
- The opposing team will be assessed within a scale of +10 and -5.
- The next team will choose the next question.

What is the relatively dark,  
central part of a sunspot  
called?



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# Umbra



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Why does the moon appear red during a lunar eclipse?



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The Sun's (longer wavelength) light is scattered due to the Earth's atmosphere.



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How many minutes does it  
take for night sky to appear to  
rotate by 10 degrees?



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40 minutes. Or more  
accurately 39.89 minutes  
because sidereal day is 23  
hours and 56 mins.



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Why is the North Star not  
always Polaris?



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There is precession. The axis of Earth's rotation is rotating about another axis (about once every 26,000 years). Thus the direction of North is also constantly changing. Thus the north star will not always be Polaris.



Explain two different types of precession that the Earth undergoes.



Axial precession (Movement  
of the axis of rotation that  
traces out a cone)

Perihelion precession (The  
change in the location of the  
perihelion of orbit with  
reference to the stars)



Why doesn't Mars have a significant atmosphere?



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Mars is quite small (mass) thus the gravity isn't very strong to hold the gases.



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In February this year, a meteorite hit Russia. It is classified as an air burst.  
What does an air burst mean?



It is when the meteor that is  
about to crash with the  
ground has exploded in the  
air.



What is Mercury's core  
mainly made of?



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# Mainly Iron



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Explain the formation of the solar system as best predicted today.



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The gravitational collapse of a giant molecular cloud became the proto planetary disk, from where the planets and all the moons were formed.



Why does Venus go around  
the Sun in a different  
direction as compared to  
other planets?



No the question is a trick question.  
Venus does not have retrograde motion  
**around the Sun.** It travels in the same  
direction as all other planets.

Extra info: Venus and Uranus are the  
only two planets in the solar system  
that spin around their own axis in a  
different direction to ours.



# What does albedo mean?



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Albedo is a measure of  
reflective power of an object.  
For example, charcoal is a  
material with the lowest  
known albedo.





The above image is of the  
Barringer Crater. Where on  
Earth is it?

# The USA; Arizona.



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What is the relationship  
between the mass of a black  
hole and its density?  
Here, the volume of a black  
hole is defined by the event  
horizon.



The density is inversely  
proportional to the square of its  
mass.

$$\rho \propto \frac{1}{M^2}$$

Extra Information:

$$\rho = \frac{3c^6}{8\pi G M^2}$$



What is the Schwarzschild  
Radius of an object of mass  
approximately equal to you?  
(Assume your mass is 60kg)

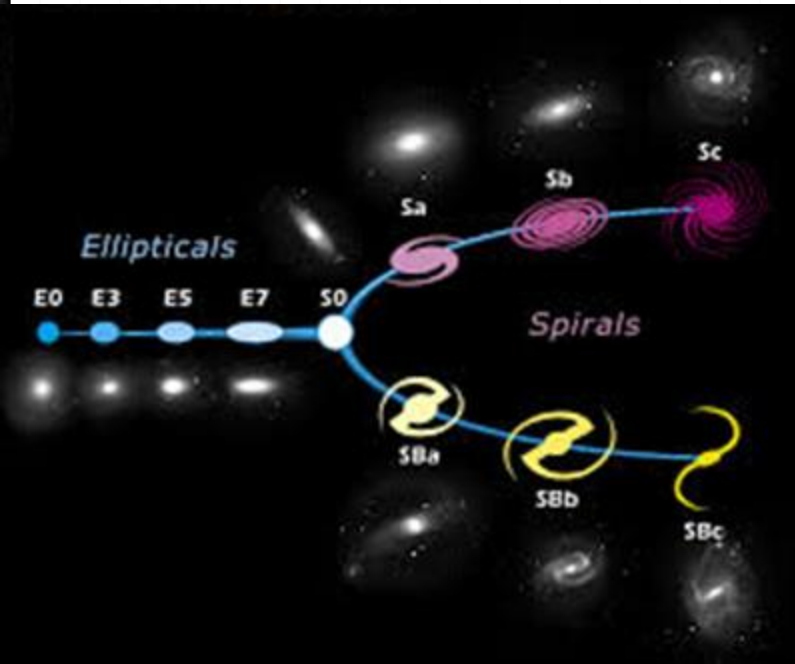


$$R = \frac{2GM}{c^2}$$

$$R = 8.893 \times 10^{-26} \text{ m}$$



In the Hubble's  
Tuning Fork  
Diagram, as  
shown above,  
there are 3 major  
classifications for  
galaxies. What are  
they?



# Elliptical Spirals Irregulars

Extra Info: Spirals are further  
classified into Ordinary and  
Barred.



State the three most basic forms of stellar fusion.



Proton-Proton Chain  
CNO (Carbon-nitrogen-  
oxygen) Cycle  
Triple Alpha Process



Suggest 2 advantages and 2 disadvantages of space telescopes, as compared to ground based ones.



## Advantages:

- Wide range of EM spectrum
- No atmospheric distortion

## Disadvantages:

- Cost (when comparing directly with exact same specifications and equipment)
- Not easy to repair
- Must be fully remote controlled



What is the most recent NASA mission that has put a probe on Mars, and when was it launched?



Curiosity, launched in 2011



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# How does interferometry work?



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By connecting a minimum of 2 telescopes and coordinating them, the resolution of a large aperture is achieved.

Extra: The Very Large Array is an example of such.



Suggest 3 different types of rocket propulsion systems.



Chemical rocket

Ion engine

Fusion Engine

Matter – Anti matter engine

Stellar (or solar) sail



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