

Space Data Science

Data Science · Answer Key · 20 Questions

1. What astronomical data measurement records an object's brightness change over time?

- A) Light curve**
- B) Spectral shift
- C) Gravitational lens
- D) Parallax angle

2. Which method do data scientists use on Kepler telescope data to detect exoplanets passing in front of stars?

- A) Transit photometry**
- B) Carbon dating
- C) Sonar pinging
- D) Thermal imaging

3. Why were physical hard drives flown by airplane to process the first image of a black hole by the Event Horizon Telescope?

- A) The data volume was too massive for internet transfer**
- B) Internet access is illegal at observatories
- C) Hard drives prevent solar radiation corruption
- D) Satellite networks do not transmit digital files

4. Which machine learning branch is commonly used to automatically categorize galaxy shapes in space images?

- A) Computer vision**
- B) Natural language processing
- C) Reinforcement learning
- D) Robotic process automation

5. What type of signals does the SETI project analyze to search for potential extraterrestrial intelligence?

- A) Radio signals**
- B) Seismic waves
- C) Ocean currents
- D) Gamma ray bursts

6. The ESA Gaia space observatory collects data to create a high-precision 3D map of which structure?

A) The Milky Way galaxy

- B) The surface of Mars
- C) Jupiter's moons
- D) The rings of Saturn

7. What physical property of a star can data scientists determine by analyzing its optical light spectrum?

A) Chemical composition

- B) Surface texture
- C) Liquid volume
- D) Core temperature gradient

8. Which facility network does NASA use to receive data transmitted from deep space probes like James Webb and Voyager?

A) Deep Space Network

- B) Global Positioning System
- C) Hubble Link Network
- D) Starlink Constellation

9. In astronomical data, what does a measured 'redshift' in light from a distant galaxy indicate?

A) The galaxy is moving away from Earth

- B) The galaxy is cooling down rapidly
- C) The galaxy is shrinking in mass
- D) The galaxy is colliding with Earth

10. Which observatories generated data that allowed data scientists to confirm the existence of gravitational waves in 2015?

A) LIGO and Virgo

- B) Hubble and Spitzer
- C) Keck and Subaru
- D) Arecibo and FAST

11. What fast-rotating neutron stars emit periodic pulses of radiation that act as precise cosmic clocks for timing data?

A) Pulsars

- B) Red giants
- C) White dwarfs
- D) Brown dwarfs

12. Which satellite provided detailed spatial mapping data of the Cosmic Microwave Background radiation left from the early universe?

A) Planck observatory

- B) International Space Station
- C) Landsat 8
- D) Voyager 1

13. What public crowdsourced science project allowed volunteers and algorithms to classify millions of galaxy images?

A) Galaxy Zoo

- B) Planet Nine
- C) SpaceInvaders
- D) CosmoNet

14. What statistical Doppler technique analyzes star velocity data to detect wobbles caused by orbiting exoplanets?

A) Radial velocity method

- B) Direct imaging method
- C) Astrotuning method
- D) Astrometric shift method

15. What imaging technique combines data from multiple photo exposures of space to reduce background noise?

A) Image stacking

- B) Lossy compression
- C) Pixel stretch
- D) Color inversion

16. Where is the Vera C. Rubin Observatory located, designed to produce terabytes of nightly sky data?

A) Chile

- B) Australia
- C) Norway
- D) Japan

17. What solar observatory continuously transmits gigabytes of high-resolution images of the Sun back to Earth every day?

A) Solar Dynamics Observatory (SDO)

- B) Cassini-Huygens
- C) Juno Spacecraft
- D) New Horizons

18. What primary repository stores raw planetary scientific data collected by NASA missions for public use?

A) Planetary Data System (PDS)

- B) Galactic Cloud Archive
- C) Space Cloud Storage
- D) Universal Data Vault

19. Data science models predicting the orbital trajectories of Near-Earth Objects are used to assess the risk of what event?

A) Asteroid impacts

- B) Solar flares
- C) Black hole creation
- D) Supernova explosions

20. Through what wave medium does the Hubble Space Telescope send its raw binary data back toward Earth relay satellites?

A) Radio waves

- B) Sound waves
- C) Infrared light beam
- D) Laser cables