06-03-2018

# Astronomers discover 3 super-Earth exoplanets

## What in news:

- In a recent discovery, astronomers have detected the presence of three super-Earths about a single star, which have characteristics suggesting they could support atmospheres.

## About news:

- Astronomers have discovered three super-Earth planets orbiting a star about 100 light-years away from our solar system.
- The three exoplanets discovered by researchers at Harvard-Smithsonian Centre for Astrophysics (CfA) in the US have radii of about 1.6, 1.3, and 2.1 Earth-radii respectively.
- All of them are categorised as super-Earths, that is, with masses that are larger than Earth's but less than Neptune's. The star named GJ9827 is one of the few known stars to have multiple transiting terrestrial-sized exoplanets that are suited for atmospheric characterisation.
- "Its three exoplanets are particularly interesting because two of them have radii between 1.5 and 2.0 Earth-radii," said Joseph Rodriguez from CfA.
- Across this range in radii, the composition of planets is expected to change from rocky to gaseous; moreover, there are relatively few such candidates for study," said Rodriguez.
- These planets orbit very close to the star, with periods of 1.2, 3.6 and 6.2 days respectively, and at these close distances they have fairly hot temperatures, estimated at 1,172, 811 and 680 degrees kelvin, researchers said.

- Future observations will probe their atmospheres and provide a much more detailed picture of this unusual family of super-Earths, they said.
- Over 3,500 extra-solar planets have been confirmed to date, according to the study published in The Astronomical Journal.
- Most of them were discovered using the transit method, and astronomers can combine the transit light curves with velocity wobble observations to determine the planet's mass and radius, and thereby constrain its interior structure.
- The atmosphere can also be studied in a transit by using the fact that the chemical composition of the atmosphere means its opacity varies with wavelength.
- By measuring the depth of the transit at different wavelengths, it is possible to infer the composition and temperature of the planet's atmosphere.

**Expected prelims question**

GJ9827 was in news recently which is related to

a) Submarine
b) Asteroid
c) Star
d) None of above

Ans - c

**Expected mains question**

Q) recently astronomers have detected the presence of three super-Earths about a single star, which have characteristics suggesting they could support atmospheres. Comment and add a note on significance of its discovery.