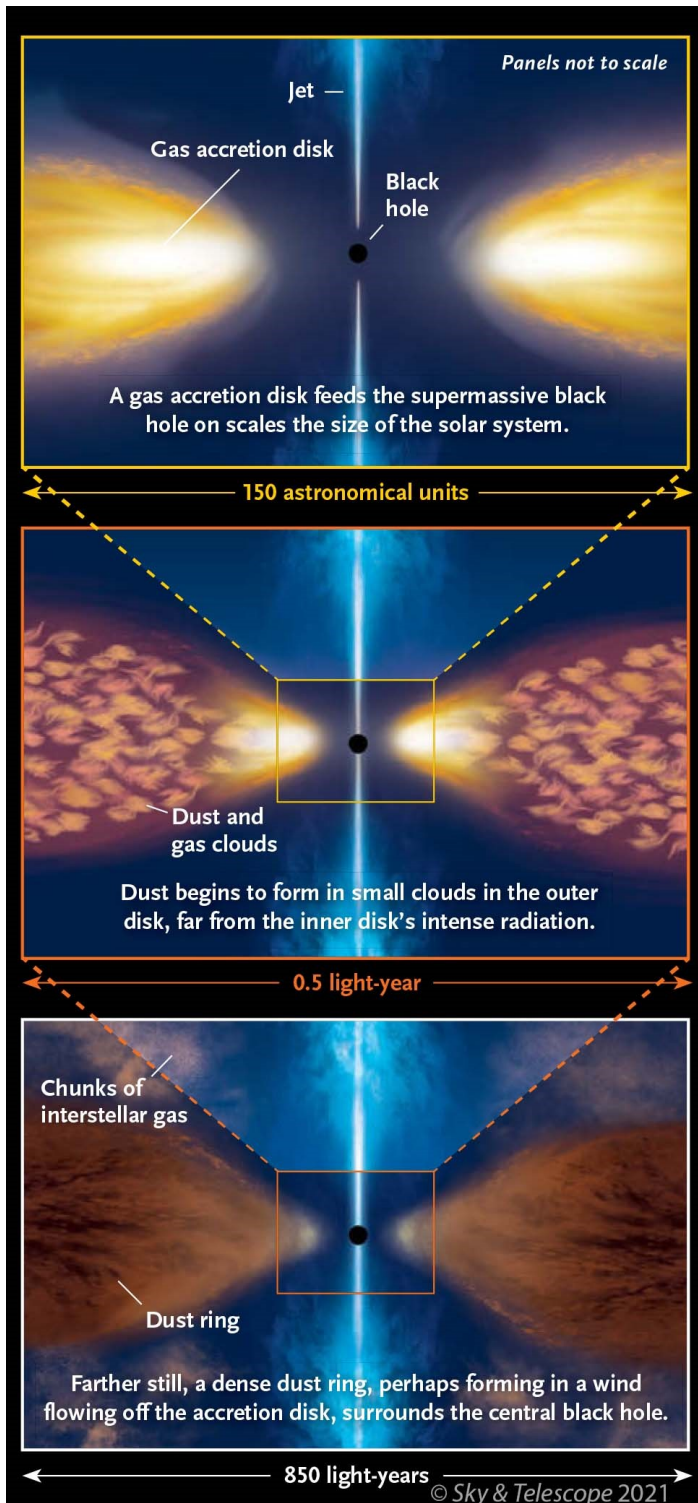


## Quasar

### Why in News?

Recently, the astronomers have identified a remarkable water reservoir circling a quasar over 12 billion light-years away.

- **Quasar** - It is a subclass of Active Galactic Nuclei (AGNs), extremely luminous galactic cores where gas and dust falling into a supermassive black hole.
- **Formation** - It occur when immense amounts of matter fall into a supermassive black hole, spiraling around it in the form of a disk before entering.
- **Luminous object** - The accretion disk is subjected to extreme gravitational and frictional forces, causing the gas and dust to heat up to millions of degrees.
- Thus, it become luminous, blasting out dazzling jets of material into the universe.
- Together, the jets and glowing disk outshine their host galaxies.
- **Features** - Though they aren't much bigger than Earth's solar system, they emit 100 to 1,000 times as much light as an entire galaxy.



- **Discovery** - They were 1<sup>st</sup> found in the 1950s and 60s and *labeled* "quasi-stellar radio sources," because they looked like stars but emitted radio waves.
- The closest quasars to Earth are 100s of millions of light-years away.

*Hubble telescope found **quasars in both spiral and elliptical galaxies**, colliding and undisturbed, which may indicate a subtler mechanism for feeding a supermassive black hole than galaxy collision.*

**Quasar APM 08279 5255**

- **Size** - It surrounds a supermassive black hole that is 20 billion times more massive than our Sun.
- **Energy** - It pumps out as much energy as a 1000 trillion suns.
- **Water reservoir** - It contains water vapour equating to 140 trillion times the volume of Earth's oceans.
- It is the farthest and largest known reservoir of water source in the universe.
- **Features** - It is emitting hydrogen-rich gases like water vapour and carbon monoxide, and creating a region 100s of light-years wide.
- The gas is warm and dense compared to typical galactic conditions.
- The intense radiation from the quasar keeps the surrounding gas active.
- It primed for star formation or feeding the black hole, potentially increasing its mass 6 fold.

## References

1. [Telangana Today| Water Reservoir Surround a Quasar](#)
2. [ESA| Quasar](#)

