



# LID 568 Black Hole

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Astronomers, using [NASA's James Webb Space Telescope \(JWST\)](#) and the [Chandra X-ray Observatory](#), have discovered a [low-mass supermassive black hole LID 568](#).

## LID-568 Black Hole:

- **About:**
  - LID-568 is a **low-mass supermassive black hole** that existed **1.5 billion years after the Big Bang**.
  - It was discovered through **X-ray and infrared observations** and is located in a galaxy with minimal star formation, likely due to the black hole's powerful outflows.
- **Key Features:**
  - **Super-Eddington Accretion:** It feeds at a rate **40 times the Eddington limit**, which is the **maximum rate at which a black hole or star can accrete matter** without radiation pressure pushing matter away.
    - **Eddington Limit** represents the **balance between gravitational pull and outward radiation pressure**, preventing further accretion if exceeded.
  - **Galaxy Effects:** The black hole's **outflows** prevent the accumulation of matter needed for star formation in its galaxy.
- **Significance:**
  - **Challenges Current Models:** LID-568's rapid growth **contradicts theories requiring sustained accretion** for supermassive black hole formation.
  - **Insights into the Early Universe:** It suggests that **short bursts of intense feeding** could explain the formation of large black holes in the early universe.
  - **Future Research:** Opens avenues for **studying black hole accretion processes** and their **impact on galaxy evolution**.

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# BLACK HOLES

## ABOUT

- A place in space with **extremely high gravity pull**; even light can't escape (hence, **invisible**)
- The strong gravity is due to matter being squeezed into a tiny space

The term 'black hole' was coined in the mid-1960s by American physicist John Archibald Wheeler

## DETECTION

- By seeing how stars very close to black holes act differently than other stars
- In April 2019, scientists at the **Event Horizon Telescope Project** released the first-ever image of a Black Hole (shadow, more precisely)

## Albert Einstein and Black Hole

- First predicted their existences in **Theory of General Relativity**
- It showed that when a massive star dies, it leaves behind a small, dense remnant core

India's first dedicated satellite, **AstroSat** observed for the very first-time rapid variability of high energy X-ray emission from a black hole system

## TYPES

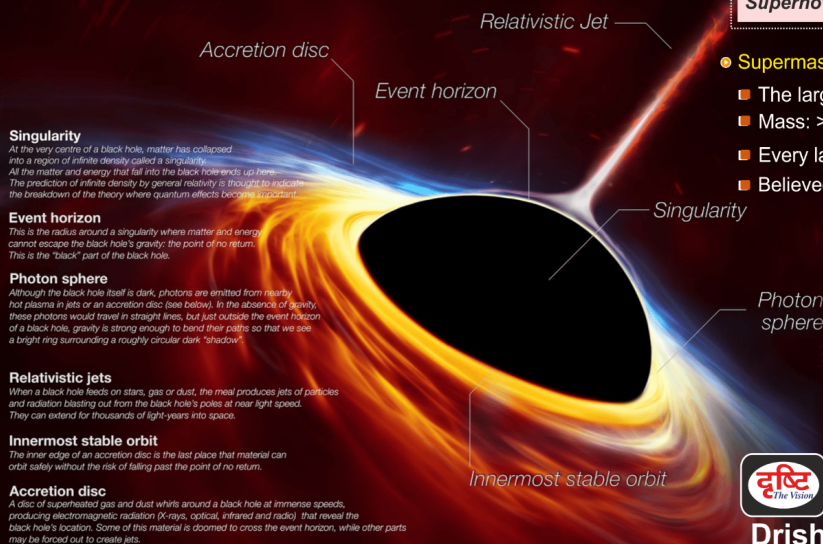
- **Miniature (Hypothetical):**
  - The smallest; size of just 1 atom
  - Mass: varies from 1/100th of a milligram to the mass of a large mountain
  - Believed to be formed when universe began
- **Stellar:**
  - Mass: **20x the mass of sun**
  - Believed to be formed due to **Supernovae explosion**

Supernova is an exploding star that has reached the end of its life

- **Supermassive**
  - The largest
  - Mass: >1 million suns together
  - Every large galaxy has a supermassive black hole at its centre
  - Believed to be made at the same time as their home galaxy

Sagittarius A is the supermassive black hole at the centre of Milky Way (mass: ~about 4 mn suns)

The Sun will never turn into a black hole as it is not big enough to make a black hole



Read More: [Black Hole Gaia BH3](#)

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