Two Massive Stars Secretly Feeding Black Hole

Prelims: *Current events of National and International Importance| Science& Technology*

Why in News?

Astronomers have traced mysterious gas clouds near the Milky Way's central supermassive black hole, Sagittarius A, to a massive binary star system (IRS 16SW) whose colliding winds compress gas into clumps that can drift inward to feed the black hole.*

How the Binary Star Feeds Sagittarius A*

- **Colliding stellar winds–** Powerful winds from the massive contact binary **IRS 16SW** collide with surrounding material, creating a shock front where gas piles up and compresses.
- **Clump formation–** Compressed gas detaches into dense clumps that travel along closely related orbits toward the galactic center, explaining gas structures such as the **G1–G2–G3** streamer.
- **Steady fuel supply–** Rather than relying solely on gas already swirling around Sagittarius A*, stellar winds from massive nearby stars can provide a continuing supply of material.

Significance

- **Explains related gas orbits–** Minor differences in the orbits of the gas clumps match the binary star's own orbital motion as the clumps are shed.
- **Links stars and black hole growth–** It connects massive star evolution and wind compression directly to how supermassive black holes get fueled, even when Sagittarius A* is relatively quiet compared to active galactic nuclei.



Reference

Science Daily| Two massive stars secretly feeding black hole

SHANKAR IAS PARLIAMENT
Information is Empowering