NASA’s Swift Observatory

Prelims: *Current events of national and international importance | Science & Technology*

Why in news?

NASA’s Neil Gehrels Swift Observatory re-entered Earth’s atmosphere, almost 22 years after launch, over Indonesia’s North Sumatra province, roughly 200 miles (322 km) north of the equator, according to NASA.

- **Swift Observatory** – It is a multi-wavelength space telescope launched by NASA to understand the universe's most violent cosmic explosions.
- **Launched in** – 2004.
- **Purpose** – Primarily designed to study gamma-ray bursts – the most intense blasts of energy in the universe – using its multi-wavelength array of three telescopes.
- **Multi-tool for exploring the universe** – Swift has also studied hundreds of supernova explosions, star-shredding black holes, stellar X-ray flares, asteroids and comets, contributing to some 7,000 published scientific papers.
- **Weight** – Roughly 3,200 pounds (1,452 kg).
- **Mission tenure** – It was originally designed for a two-year prime mission, had long outlasted its two-year design life and had been drifting toward orbital instability for months.
- **Atmospheric drag** – Operating in low-Earth orbit without an onboard propulsion system, Swift was gradually pulled downward by Earth's atmosphere.
- **Scientific Instruments**
  - Burst Alert Telescope (BAT) – Scanned the sky for sudden, high-energy gamma-ray bursts (GRBs).
  - X-ray Telescope (XRT) – Automatically re-pointed within seconds to capture X-ray afterglows.
  - Ultraviolet/Optical Telescope (UVOT) – Recorded multi-wavelength optical and UV light from transient cosmic events.
- **Rescue attempt** – In July, NASA and Arizona-based startup Katalyst launched a specially built rescue vehicle called LINK on a mission to rendezvous with Swift, latch onto the satellite and tug it into a higher, more sustainable orbit.
- But the LINK spacecraft itself began spinning uncontrollably soon after reaching space, and by mid-August, mission managers abandoned the effort, resigned to letting Swift fall back to Earth.
- **Major Achievements**
  - **Discoveries** – Recorded over 2,000 gamma-ray bursts (including the exceptionally bright GRB 221009A, or "BOAT"), 1,400+ supernovae, and tidal

disruption events.

- **Multi-Messenger Astronomy** – Detected UV light from the 2017 binary neutron star merger (GW170817) and linked deep-space neutrinos to a distant blazar.
- **Scientific Legacy** – Generated roughly 7,000 published research papers and a 12-terabyte public data archive.

References

1. DD News | NASA’s 22-year-old Swift satellite telescope falls from orbit in fiery finale
2. NASA | NASA’s 22-year-old Swift satellite telescope falls from orbit in fiery finale

SHANKAR IAS PARLIAMENT
Information is Empowering