C. V. Raman

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

Why in News?

Recently, National Science Day (February 28) is being observed to honour C. V. Raman's discovery of the Raman Effect and his Nobel Prize-winning contribution to physics.

- **Born in –** ***7th November 1888, Tiruchirapalli***, Tamil Nadu.
- **Parents –** R. Chandrasekhar Iyer (Lecturer in Physics and Mathematics).
- **Early Brilliance –** Won gold medals in Bachelor's and Master's degrees.
- Published first paper at age 18 in *Philosophical Magazine*.
- **Early Career –** Assistant Accountant General, Indian Finance Service (1907), Calcutta.
- **Research Work – Early Phase –** Conducted research at the Indian Association for the Cultivation of Science during spare time.
- **Later Years –** *Optics, crystal dynamics*, diamond structure, colours of flowers, human vision.
- **Academic Career –** Professor of Physics at Calcutta University (Palit Chair) for 15 years.
- Director, Indian Institute of Science (1933–1937).
- Founded Raman Research Institute in 1948.
- **Major Discovery –** Raman Effect (1928).
- **Nobel Prize –** Nobel Prize in Physics (1930), ***first Indian and person of colour to receive it in Physics.***
- **Mentorship –** *Mentored Vikram Sarabhai* in cosmic ray research.
- **Legacy –** Raman Effect used in cancer detection, drug development, and space exploration; inspiration for National Science Day.
- **Death –** 1970.

Raman Effect (Raman Scattering)

• Raman scattering is a spectroscopic technique based on the inelastic scattering of monochromatic light (usually from a laser).
• **Aim –** To study ***vibrational, rotational and other low-frequency*** modes in a system.
• **Principle** – When a photon interacts with a molecule, it transfers energy, causing the molecule to vibrate or rotate.
• The scattered light shows a change in frequency (Raman shift), which is characteristic of the molecule.
• **Types of Raman Scattering – Stokes Raman Scattering –** If the scattered photon has a lower frequency; molecule gains energy.
• **Anti-Stokes Raman Scattering –** If a scattered photon has a higher frequency, the molecule loses energy. (Stokes scattering is more common.)

Reference

TH | C.V. Raman