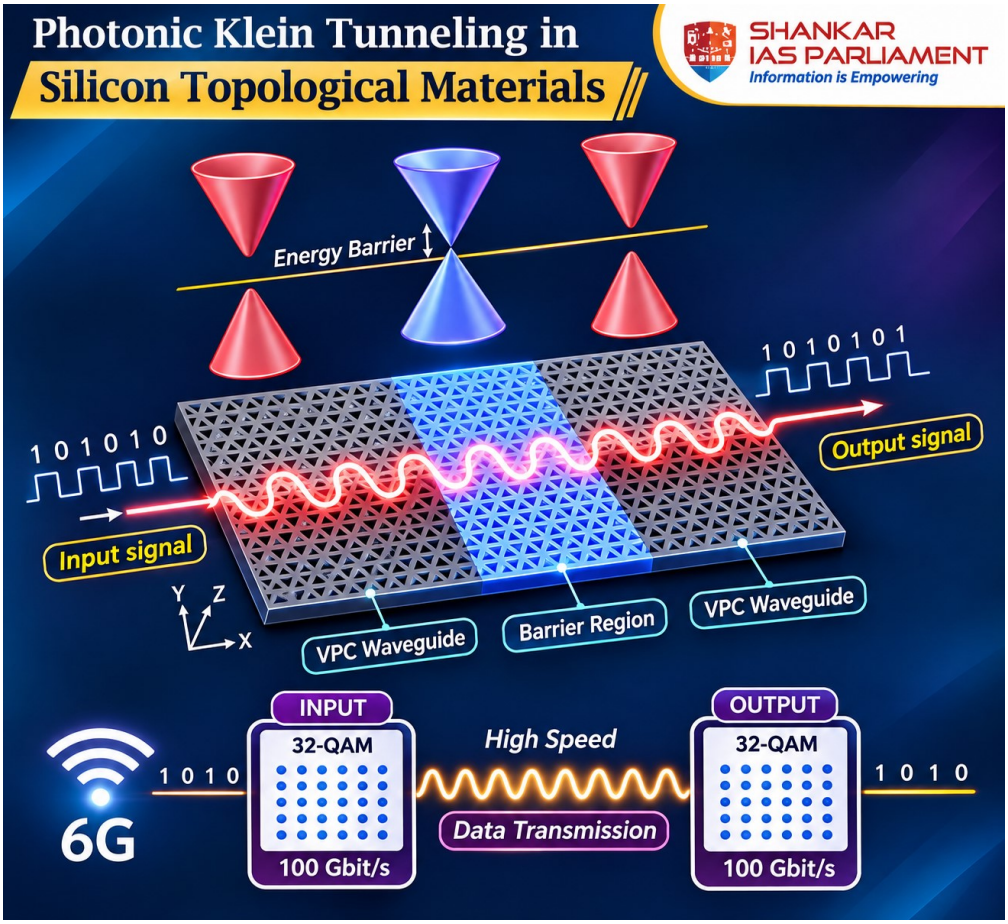
# Silicon Chip for Terahertz 6G Communication

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## Why in News?

*Researchers at the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR)—an autonomous institute under India's Department of Science and Technology—have developed a breakthrough silicon chip designed for terahertz (THz) 6G communication.*

- **Data Transmission Speed–** Reaches up to **100 Gbit/s**, paving the way for ultra-high-speed wireless connections.
- **Topological Photonics Design–** Uses a silicon photonic crystal with triangular holes arranged in a graphene-like honeycomb lattice. This structure guides terahertz waves along specific boundaries, making them resistant to certain types of backscattering.
- **Low Signal Loss–** Passing through a single engineered barrier results in only **1–2% signal loss**, while two consecutive barriers result in about **2–3% loss**—vastly outperforming traditional, non-topological waveguides.
- **CMOS Compatibility–** Fabricated on high-resistivity silicon, making the chips compatible with standard semiconductor manufacturing processes.
- **Future Plans–** The research team aims to tune these barriers electrically, thermally, or mechanically to redirect signals between different on-demand pathways inside compact circuits.




## Reference

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