Uttarakhand First Nanofabrication Facility | Uttarakhand | 13 Mar 2025

Why in News?

IIT-Roorkee has established a **cutting-edge nanofabrication facility** in Uttarakhand to advance **India's semiconductor manufacturing mission.**

Key Points

- **International Collaboration:**
  - IIT-Roorkee collaborated with **Taiwan's premier semiconductor institutions** to exchange expertise.
  - **The Department of Science and Technology (DST)** funded the project, which began in 2019.
- **State-of-the-Art Infrastructure:**
  - The facility features cutting-edge instruments, including:
    - 50 kV **Electron Beam Lithography (EBL)** system with 10nm resolution.
    - **Inductively Coupled Plasma RIE (ICP-RIE)**, a key etching technology for semiconductor manufacturing.
  - Equipped with ultra-clean rooms featuring controlled environments:
    - Class 100 space (300 sq ft) and Class 1000 space (600 sq ft) for precision research.
- **Research Applications:**
  - The facility supports cutting-edge research in:
    - **Quantum sensors**
    - **Spintronics**
    - Memory devices
    - Thin-film devices
    - **Photodetectors**
    - **Quantum optics**
    - **Photonic crystals**

Department of Science and Technology

- The **foundation of DST was laid on 3rd May 1971** along the model of National Science Foundation (NSF), USA.
- It provides **funding and also makes policies** and co-ordinates scientific work with other countries.
- It **empowers scientists and scientific institutions** and also works with a highly distributed system permeating stakeholders ranging from school college, PhD, Postdoc students, young scientists, startups and NGOs working in Science & Technology.
- DST's budget has increased over the years by 100%, which has allowed initiation of new programmes in a wide range of areas.

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