

What are Gallium Nitride Nanostructures?

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About Gallium Nitride (GaN) Nanostructures:

- Blue light emission from GaN has been known for some time, and it is used in LEDs, this is the first time that infrared light-matter interactions are demonstrated in GaN.
- For this demonstration, they have utilized a scientific phenomenon called **surface polariton excitations**.

What is surface polariton?

- These are special modes of electromagnetic waves travelling at the interface of a conductor and an insulator such as air.
- These are quasi-particles which have both **light and matter characteristics**.
- By altering the morphology and shape of the nanostructures, they are also able to excite plasmon polaritons in GaN, which results in extending the light-matter coupling to further reaches of the electromagnetic spectrum.

What is GaN?

- It is a very hard and mechanically stable wide band gap (WBG) semiconductor, as it has a **hexagonal crystal structure**.
- The critical factors of gallium nitride: Its **reliability, compact size, high efficiency, fast switching speed, low on-resistance, and high thermal conductivity**.

Applications of the GaN nanostructure

- It can be helpful in highly efficient infrared absorbers, emitters, and modulators that are useful in defence technologies, energy technologies, imaging, sensing.

Q1) What are the uses of nanostructures?

Nanostructured materials are having applications in various sectors of the food science comprising nanosensors, new packaging materials, and encapsulated food components. Nanostructured systems in food include polymeric nanoparticles, liposomes, nanoemulsions, and microemulsions

Source: PIB

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