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JNCASR develops flexible near-infrared plasmonic devices for wearable sensors and medical imaging tools

13 December 2024 | News

This research holds promise for a wide array of industries, from telecommunications to biomedicine



In a significant advancement in nano-photonics, scientists at the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru, an autonomous institute under the Department of Science and Technology (DST), have introduced a new approach to achieve flexible near-infrared plasmonic devices using affordable scandium nitride (ScN) films.

This could revolutionise the design of future optoelectronic devices, flexible sensors, and medical imaging tools that rely on NIR light, by introducing scalable and cost-effective plasmonic materials

Plasmonics is a field that leverages the interaction between light and free electrons in metals to create extremely confined electromagnetic fields. Traditionally, plasmonic materials have been rigid and possess limited design possibilities. Most of them like gold or silver, tend to be costly and possess limited versatility.

The team used a process by which single-crystal layers are deposited onto a substrate, technically called epitaxial growth. The technique they used stacks layers of materials with weak interlayer bonding to enable new device architecture (van der Waals heteroepitaxy).

The study, recently published in *Nano Letters*, highlights the potential of scandium nitride as a promising plasmonic material for applications that require both flexibility and precision in near-infrared (NIR) optics.