Method for Processing Large-scale Nanohole Framework

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Categories:
- Materials and Manufacturing
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- Materials and Manufacturing
- Nanohole
- Optical Sensing
- Optics
- Photonic Devices
- Thin Films

Researchers at Purdue University have developed a nanostructured plasmonic framework with vertically built-in nanohole arrays in deep-subwavelength scale (~ 6 nm) using a two-step fabrication method. This technology shows high epitaxial quality, large surface coverage, and novel optical functionalities such as enhanced zero-order transmittance and tunable anisotropic dielectric functions approaching epsilon-near-zero (ENZ) in-plane with a hyperbolic transition in the visible regime. Furthermore, this solid state thin-film form provides enhanced durability while presenting potentials, not limited to the fundamental research in the optical community, but applicable as robust reusable optical sensing, high sensitivity molecular tracing, safety detection, and on-chip integration for large-scale solid state photonic devices.

Advantages:

-Deep subwavelength scale
-Tunable
-Durable

Potential Applications:

-Optical sensing
Solid state photonic devices
-Molecular tracing

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