

Scientists create flexible wearable technology for UV

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Credit: Nanyang Technological University

To enable the development of wearable devices with advanced ultraviolet (UV) detection capabilities, NTU Singapore scientists have created a new type of optical sensor that is both flexible and sensitive. Although invisible to the human eye, UV light surrounds us. The environment and overexposure can cause health problems such as skin cancer and premature skin aging. UV intensity is usually reported through a weather forecast index. Wearable devices that monitor actual personal UV exposure throughout the day, such as T-shirts and watches, are a convenient and accurate guide for anyone who wants to avoid sun damage.

In their study published on the cover of the journal *ACS Nano*, NTU researchers report that flexible UV light sensors are 25 times more responsive and 330 times more sensitive than existing sensors, exceeding the performance levels required for optoelectronic applications or light-based electronics. Did.

NTU team has a flexible UV light sensor **Semiconductor wafer** It is 8 inches in diameter and uses a free-standing single crystal layer of gallium nitride (GaN) and aluminum gallium nitride (AlGaN), and is arranged using a film (heterostructured film) composed of two different thin semiconductor layers.

This type of semiconductor structure can be manufactured using existing industry compatible methods, which makes it easy to bend the material, making it ideal for use in flexible sensors. At the same time, the chemical composition of the material changes with depth, maintaining high performance under strain.