Ultrasensitive High-speed Perovskite Photodetectors
超靈敏、高速鈣鈦礦光電探測器

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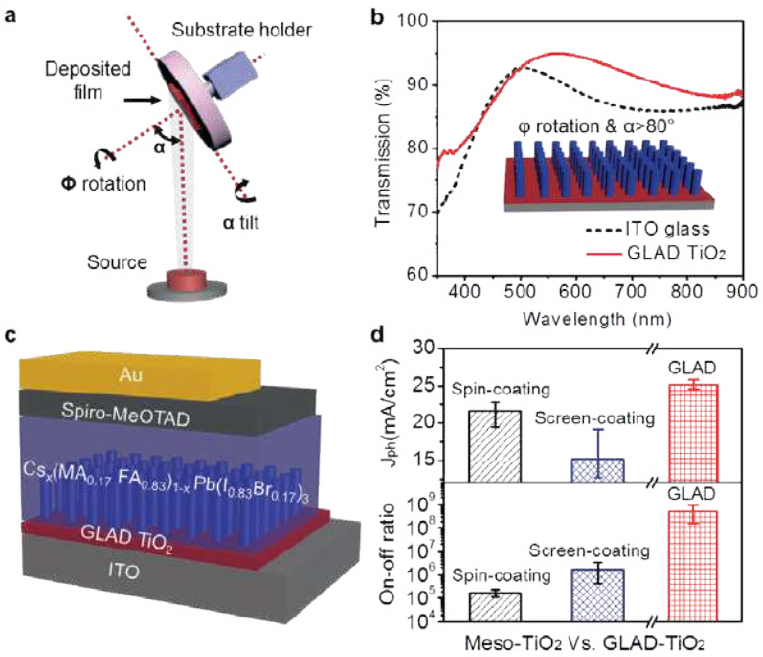
Special features 技術特點

- *Simple method yet highly compatible*
  製備方法簡單，兼容性高
- *Low cost, highly sensitivity and fast responding system*
  低成本，高靈敏度和高速系統



Photodetectors are key components for visible light communication. Commercially available photodetectors based on traditional crystalline inorganic semiconductors (e.g., Si and InGaAs) need expensive high- vacuum epitaxial growth.

A simple method is designed to fabricate the pre-contact layer of perovskite photodetector. The device performance was the best up to recent reported n-i-p photodiodes (Detectivity>10^{14} Jones & response speed< 1μs) with a low-temperature glancing angle deposited TiO nano-forest.

Low temperature fabrication (<80°C) enables the compactness with wearable electronics, like bendable/foldable smartphones, wearable healthcare equipment, etc. To be highlight, this controllable growth technique can be used to fabricate other transporting layers and metal electrodes in solar cells, lithium ion batteries, thermal and mechanical sensors, light-emitting diodes, etc.

可見光通訊的需求日漸增加，估計其市場份額將在2024年達到1,013億美元。現時，光電探測器的製造方法較複雜，而且成本較高。故此，理大團隊研發在鈣鈦礦光探測NIP二極體結構中，利用斜角度沉積法來製備低溫的二氧化鈦納米陣列(<80℃)。這簡易高效的方法提高了光探測模組與讀寫電路的可相容性，可拓展應用到其他金屬氧化物傳輸層或者金屬電極的製備。

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