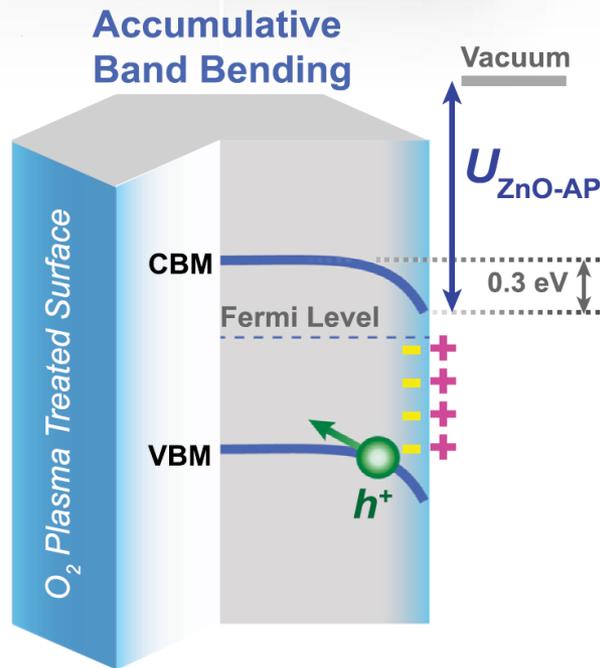


Atomic Flaws Create Surprising, High-Efficiency UV LED Materials



The study indicated that the plasma treated surface of the nanowire creates 'a bend' on the Fermi level, which could be the cause for the higher efficiency.

D. Yan, W. Zhang, J. Cen, E. Stavitski, J. Sadowski, E. Vescovo, A. Walter, K. Attenkofer, D. Stacchiola, M. Liu. *Appl. Phys. Lett.* **111**, 231901, (2017)

Work was performed at Brookhaven National Laboratory

Scientific Achievement

Scientists revealed a surprising discovery: subtle imperfections on the surface of LED nanowires can dramatically increase their efficiency and ultraviolet light output.

Significance and Impact

This counterintuitive revelation may inspire new nanomaterial designs far beyond LEDs that would otherwise have been dismissed.

Research Details

- At CFN, zinc oxide nanowires were synthesized.
- They used different processing steps to compare the effect on the efficiency of the nanowires.
- Using X-ray characterization techniques at two NSLS-II beamlines, ESM and ISS, they determined how each treatment step affects the efficiency of the nanowires.