

Subwavelength Lateral Spectral Splitting

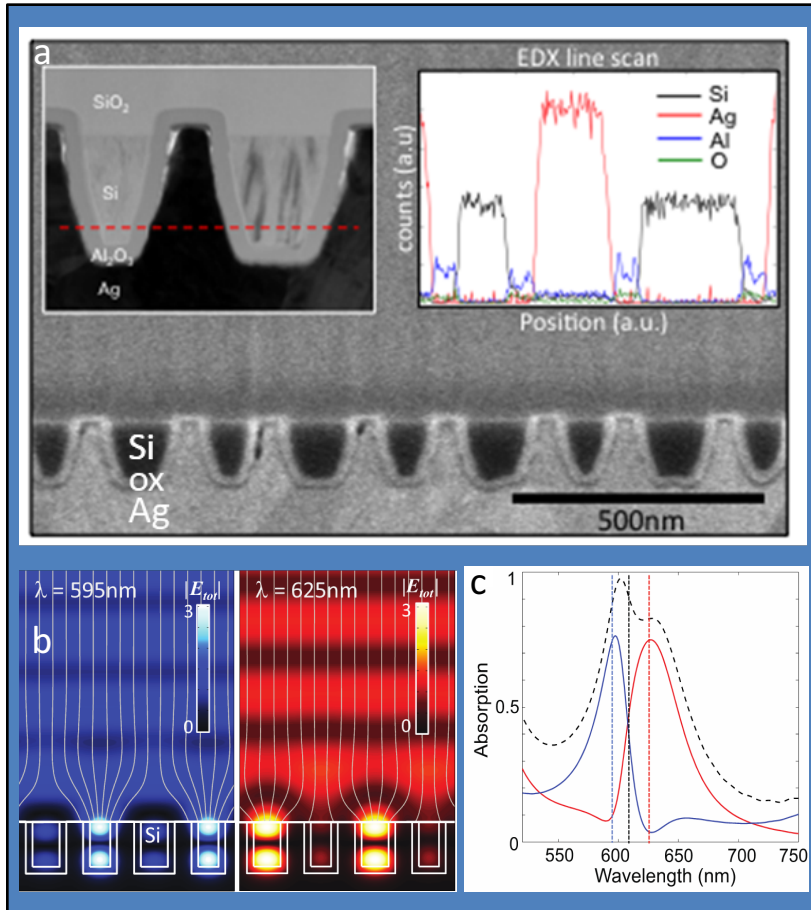


Figure: a) Cross sections of the photon sorting device
b) Simulations showing photon sorting
c) Absorption in narrow and wide Si beams

Scientific Achievement

Realized a way to perform highly effective photon sorting by wavelength at the nanoscale.

Significance and Impact

Spectral splitting can be employed to create multi-junction solar cells that offer substantially higher efficiency than single junction cells.

Research Details

- Proof-of-concept spectral splitting devices were realized to demonstrate photon sorting and subsequent charge extraction (panel a).
- Simulations demonstrate extremely effective photon sorting by wavelength using optical resonances in dual-sized Si nanowires (panel b)
- Near-unity absorption can be achieved in the semiconductor (panel c)

Work was performed at Stanford University

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