Broadband light management using low-Q whispering gallery modes in nanoshells

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2000 In Imagination 100 Years Ago

At School

A Tailor

A Well-trained Ochestra

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Light Matter Interaction

- Key to the foundations of modern technologies
Optical Cavities
Yablonovitch’s $4n^2$ limit
Light Management with Nanostructure
Whispering Gallery Mode Resonators
WGM in Nanoshells
Enhanced Electric Field
Light Trapping
by Nanoshell Array
Random Structure – Broad Band
Thickness of the Nanoshells

![SEM images of nanoshells]

**Graph 1:**
- **Y-axis:** Resonance peak wavelength (nm)
- **X-axis:** Shell thickness (nm)

**Graph 2:**
- **Y-axis:** Absorption (%)
Multiple Nanoshell Layers
Flexibility
Summary

- Discovered the WGM mechanism that leads to the light trapping.

- Creation of nanoshell array with very high light absorption, especially at long wavelengths

- Optimized structure parameters to maximize light absorption
Acknowledgement

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Thank you