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

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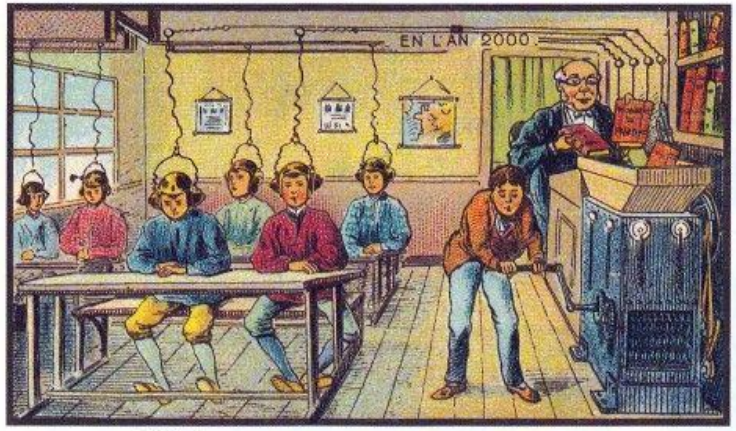
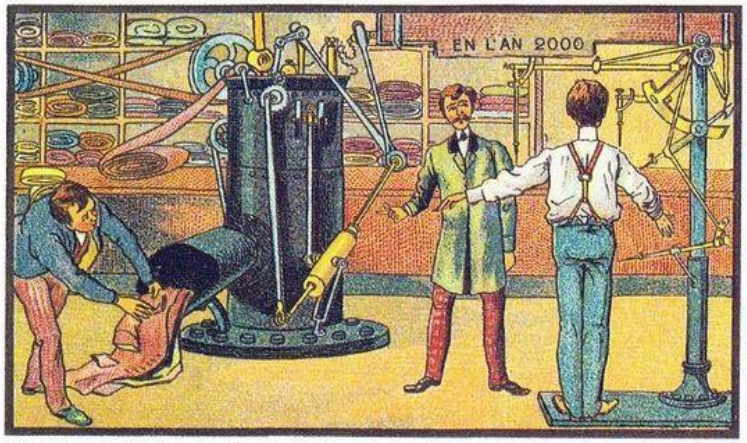
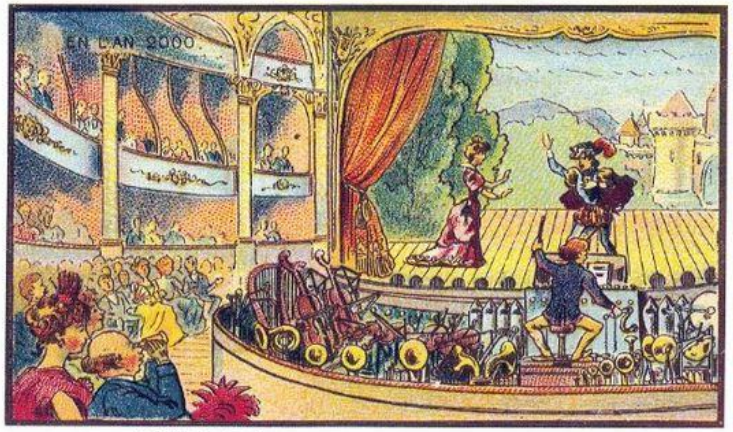
2000 In Imagination 100 Years Ago



At School



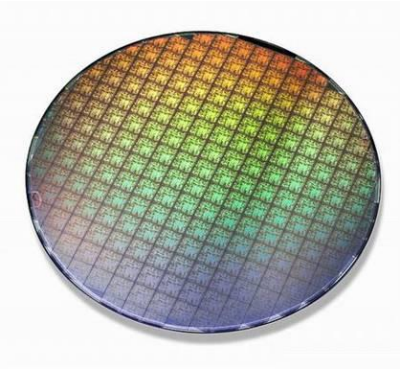
A Tailor



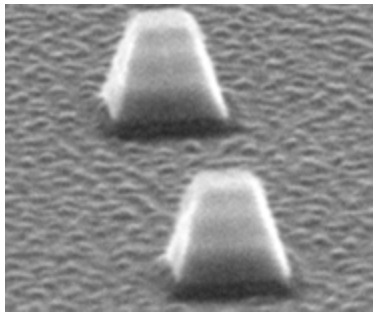
A Well-trained Ochestra

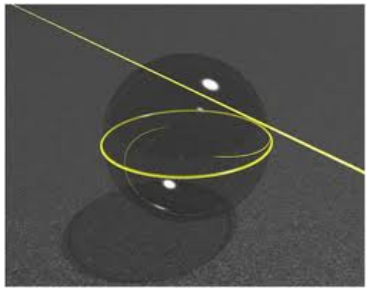
Light Matter Interaction

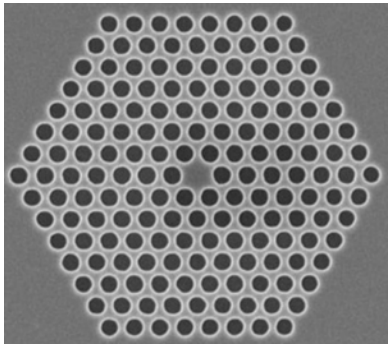
- Key to the foundations of modern technologies

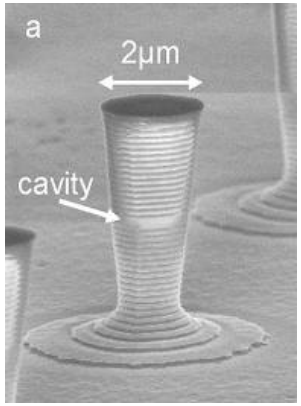


Optical Cavities

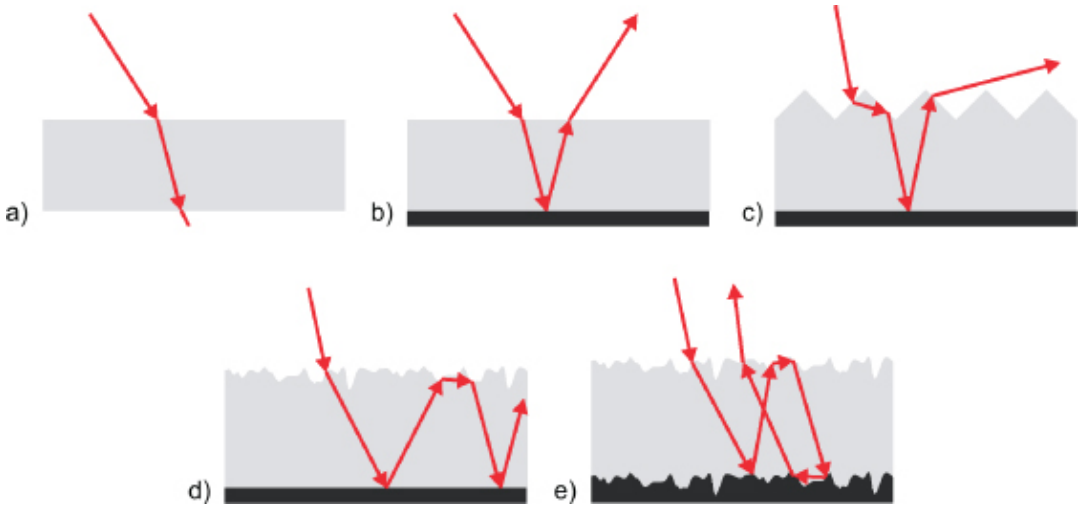




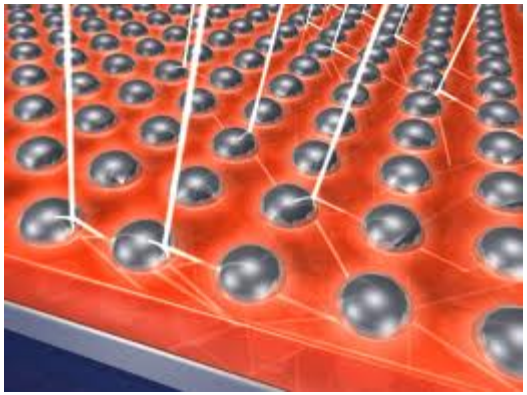


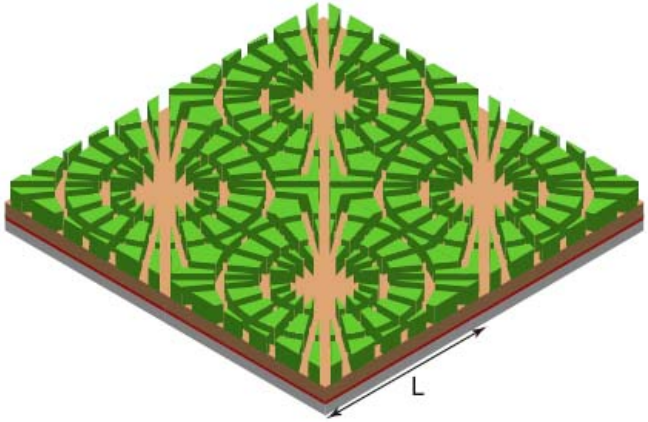


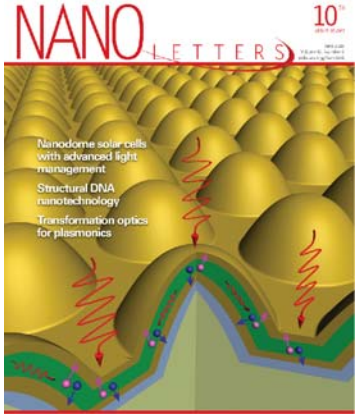
Yablonovitch's $4n^2$ limit



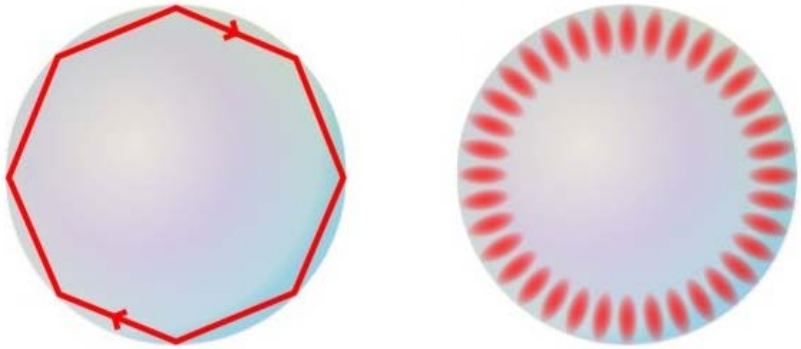
Light Management with Nanostructure

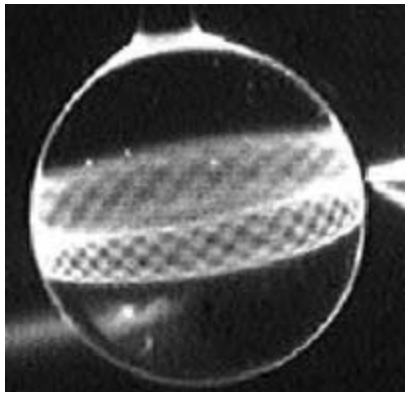


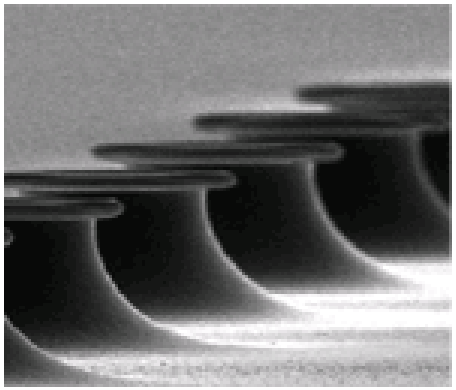


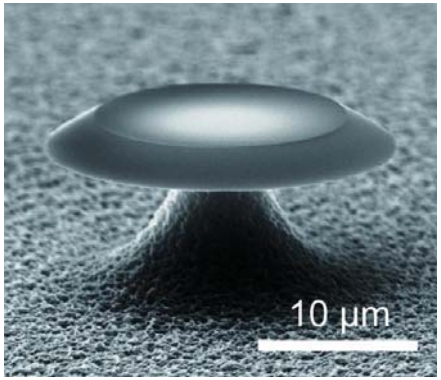


Whispering Gallery Mode Resonators

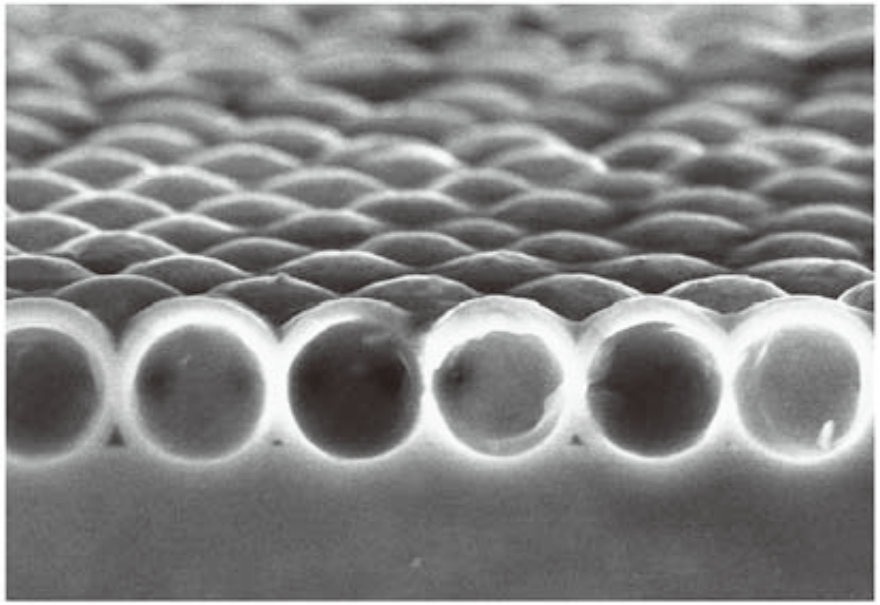


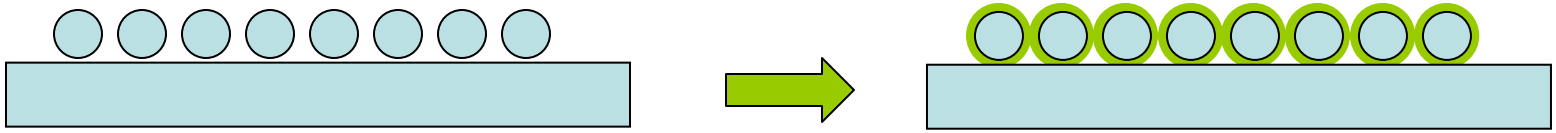




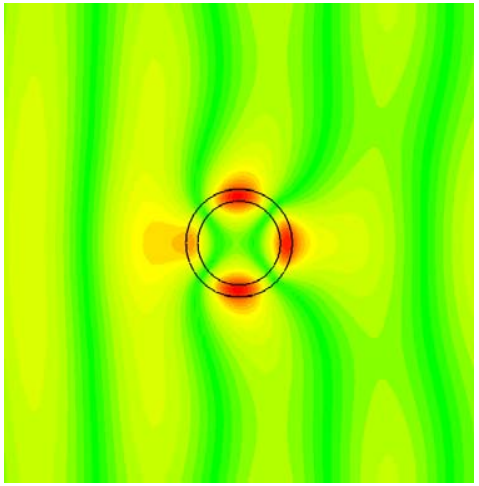


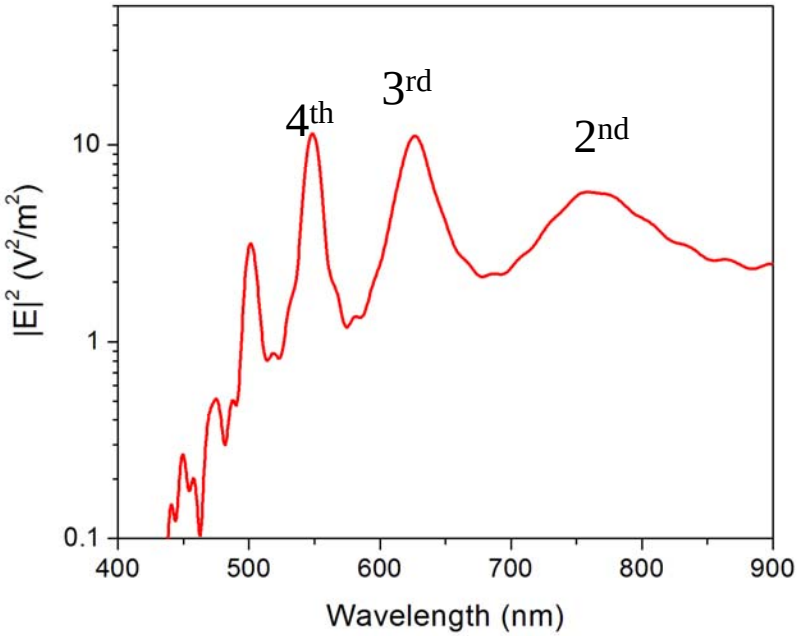
WGM in Nanoshells



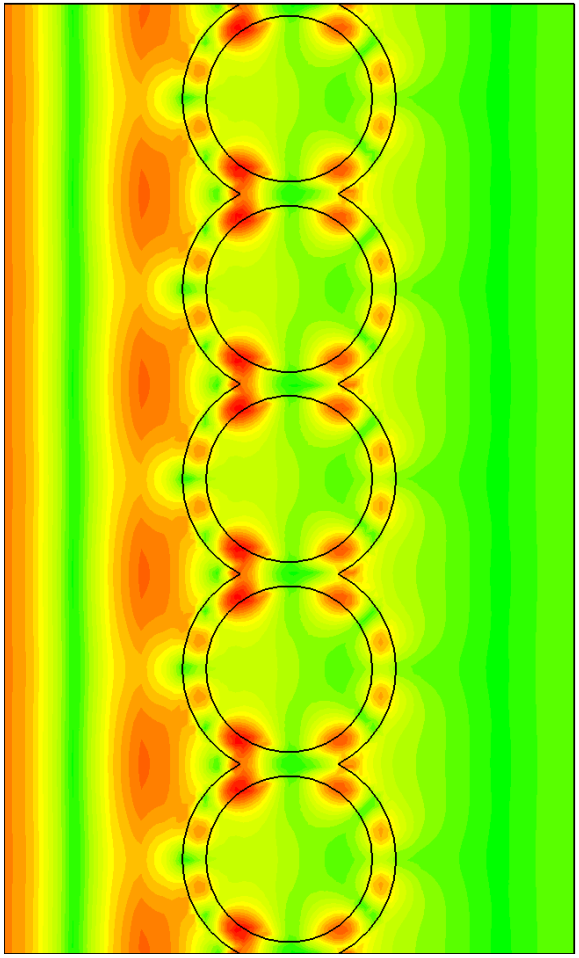


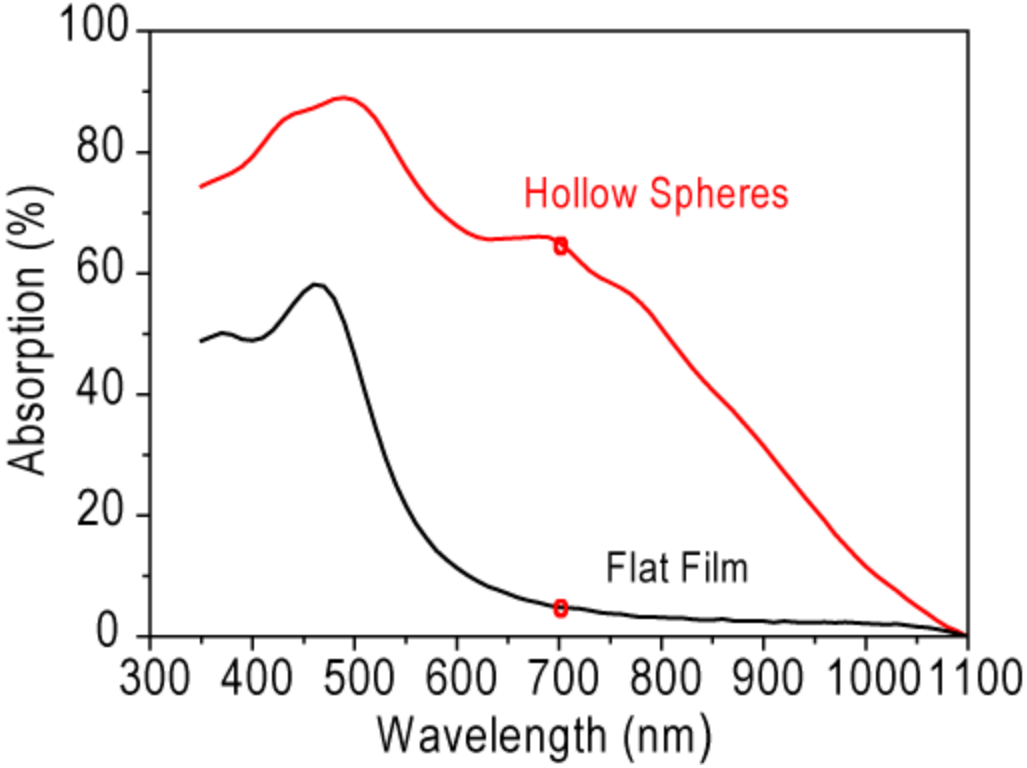
Enhanced Electric Field



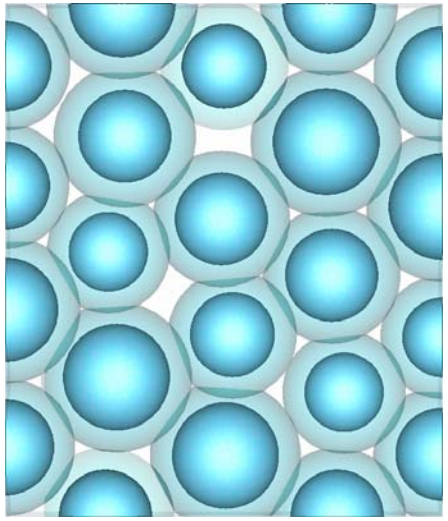


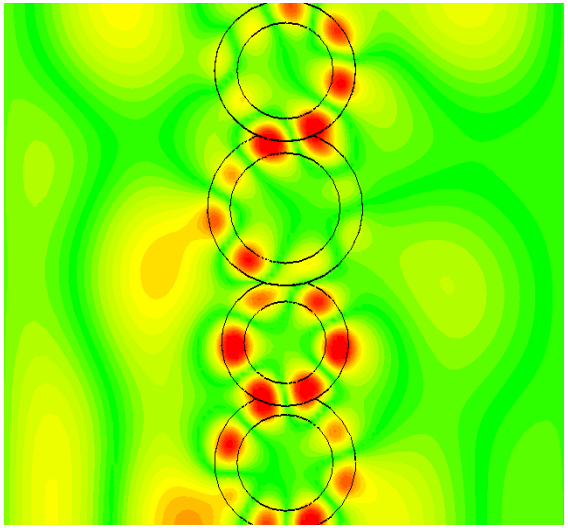
Light Trapping by Nanoshell Array

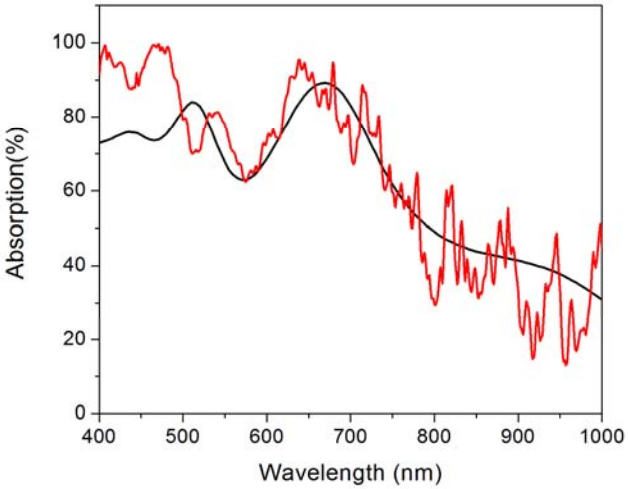




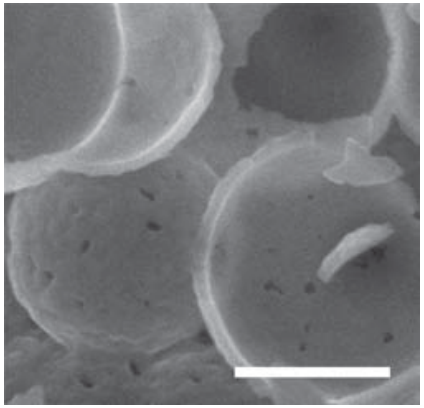
Random Structure – Broad Band

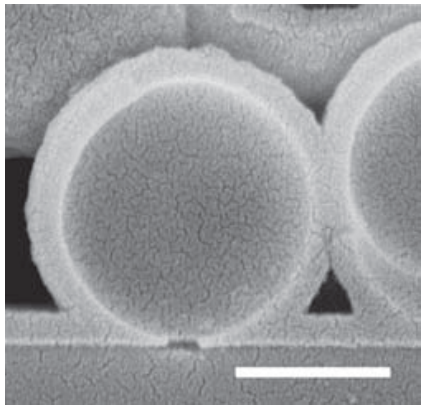


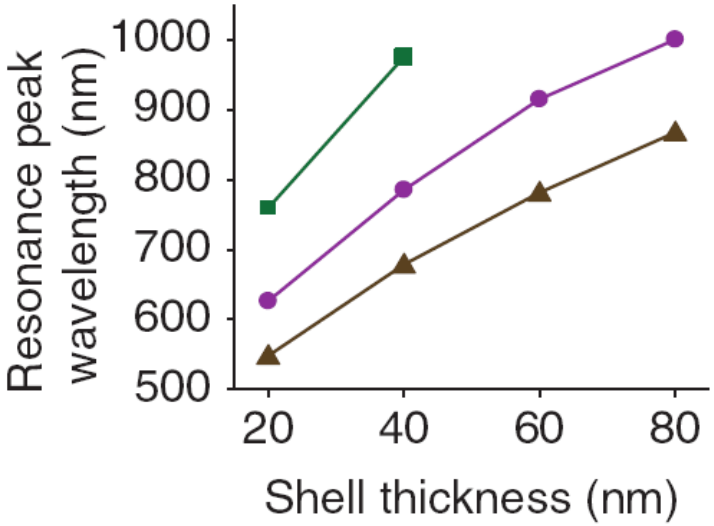


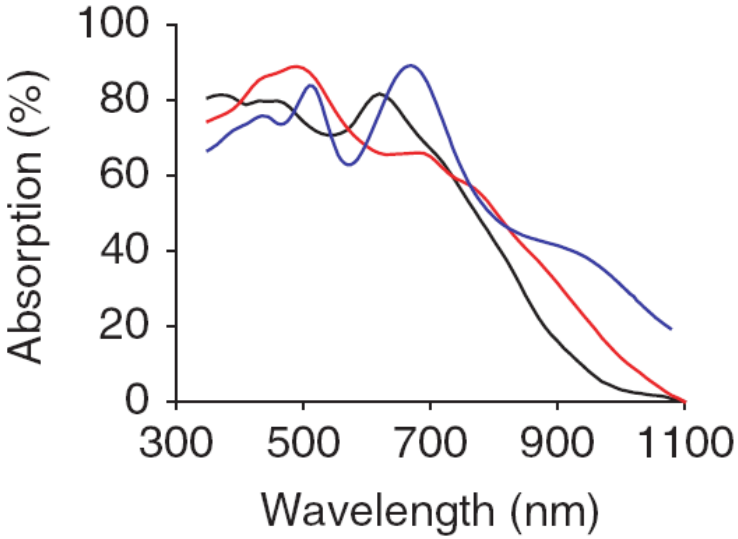


Thickness of the Nanoshells

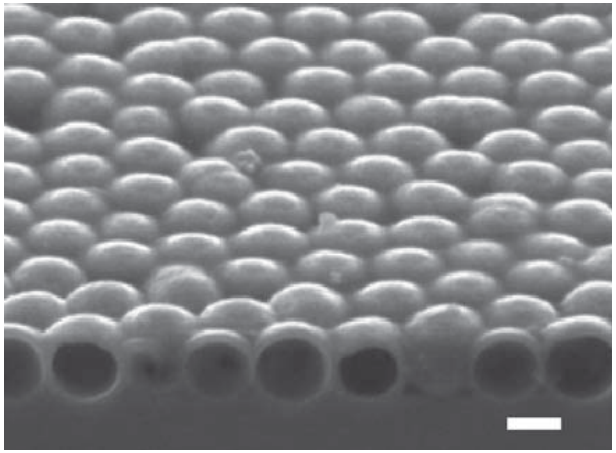


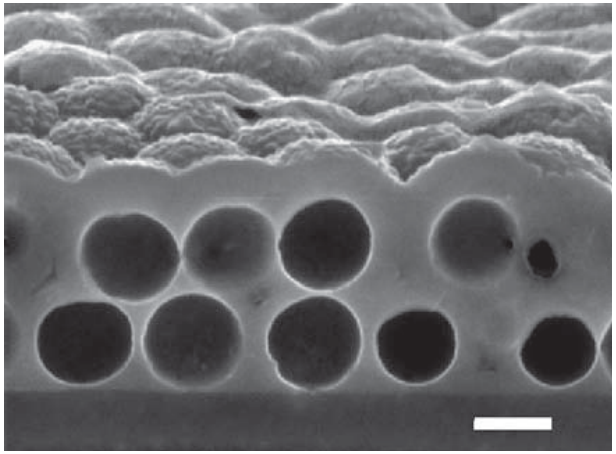


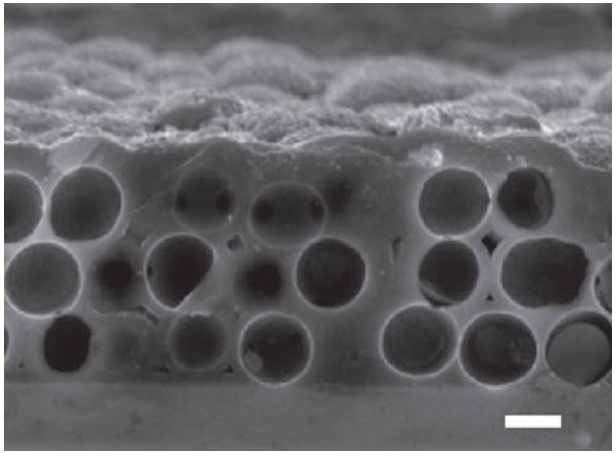


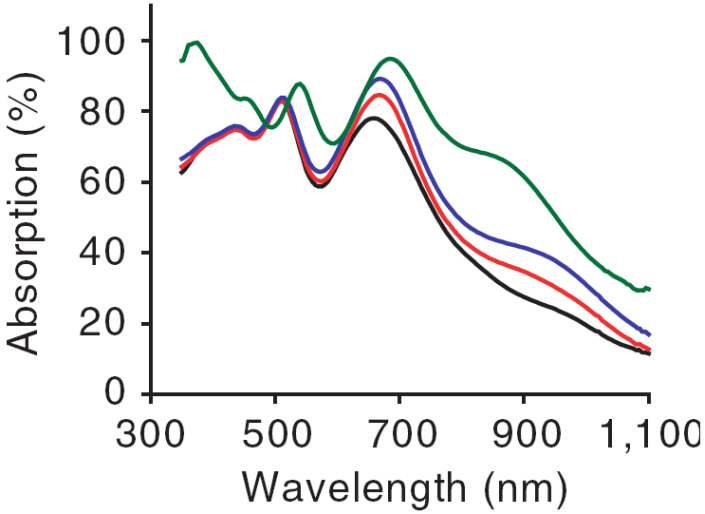


Multiple Nanoshell Layers

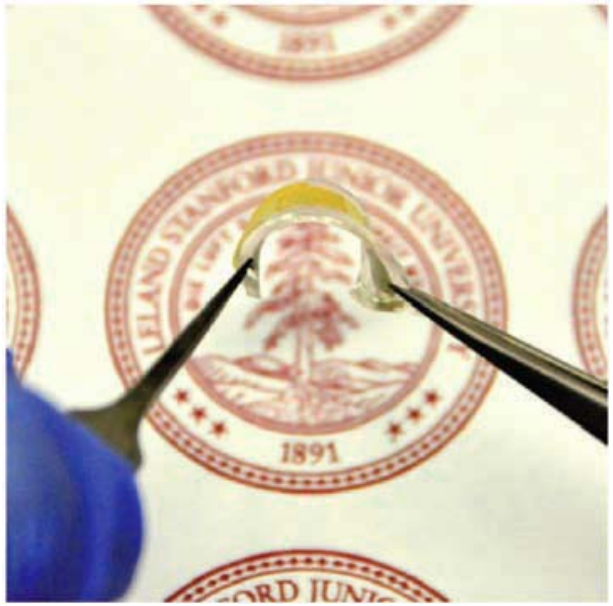


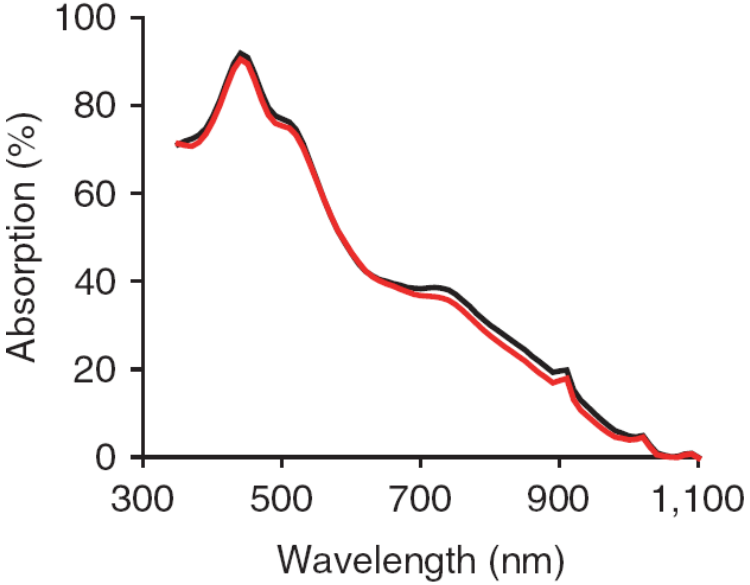






Flexibility





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

Prof. Yi Cui's group

KAUST
King Abdullah University of Science and Technology

Thank you