**Spectroscopic study of upconversion nanoparticles**

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Tremendous progress in nanotechnology has promised advances in the use of luminescent nanomaterials in imaging, sensing and photonic devices. This translational process relies on the controllable photophysical properties of the building block – luminescent nanoparticles. Among various probes, upconversion nanoparticles (UCNPs) are the unique anti-Stokes emission particles, enabling the conversion of near-infrared light to visible/UV light. In this talk, I will introduce our recent spectroscopic studies of ensemble and single UCNPs for nanothermometry and optical multiplexing.

**References:**

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[2] Zhou J\*, Wen S, Liao J, Clarke C, Tawfik S, Ren W, Mi C, Wang F, Jin D\*, “Activation of surface dark layer to enhance upconversion in a thermal field”, Nature Photonics 2018, 12, pp. 154-158.