

Bright and Dark Field Imaging of Plasmon Resonance in Nanoparticles

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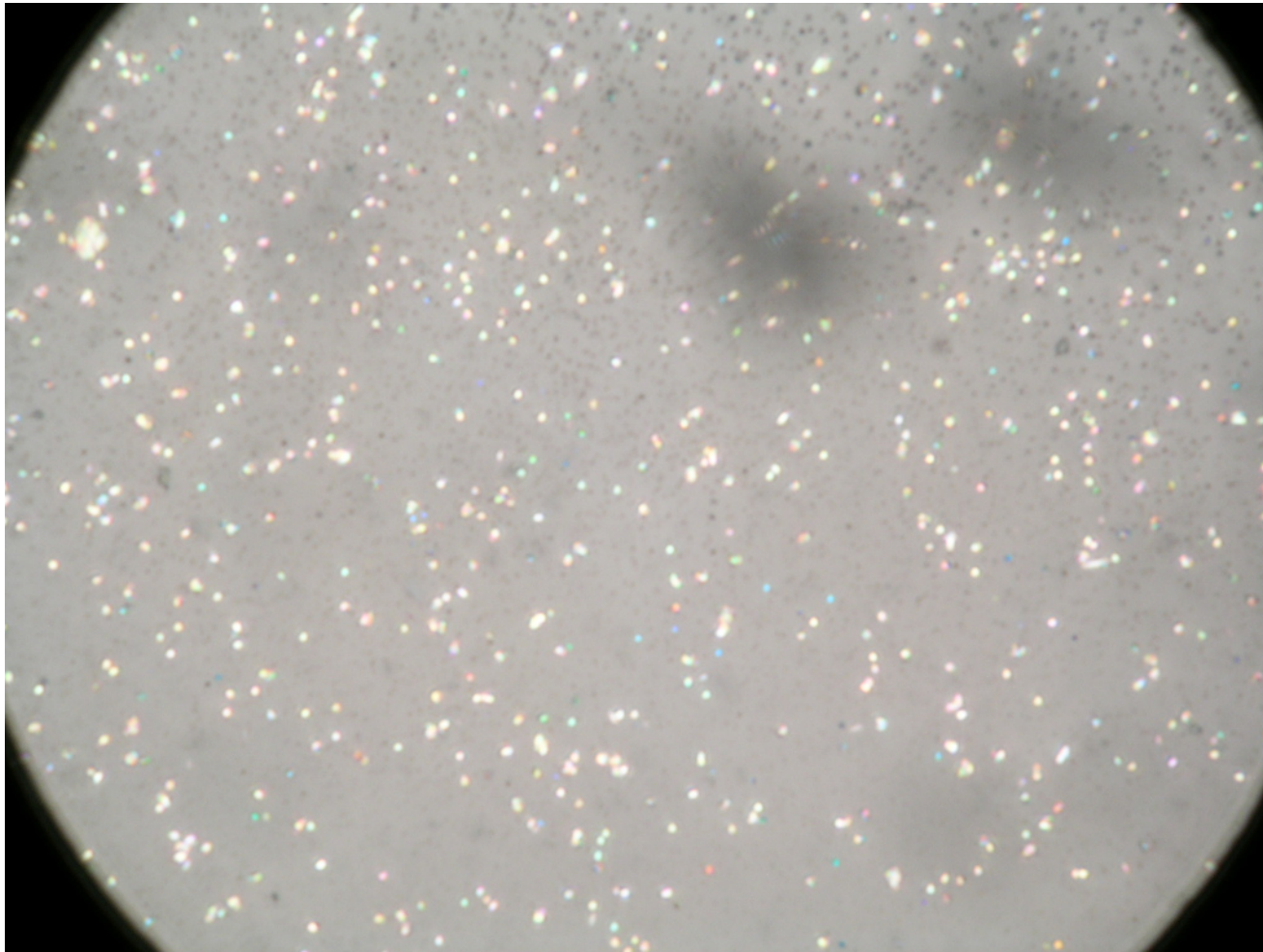
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Plasmon Resonance

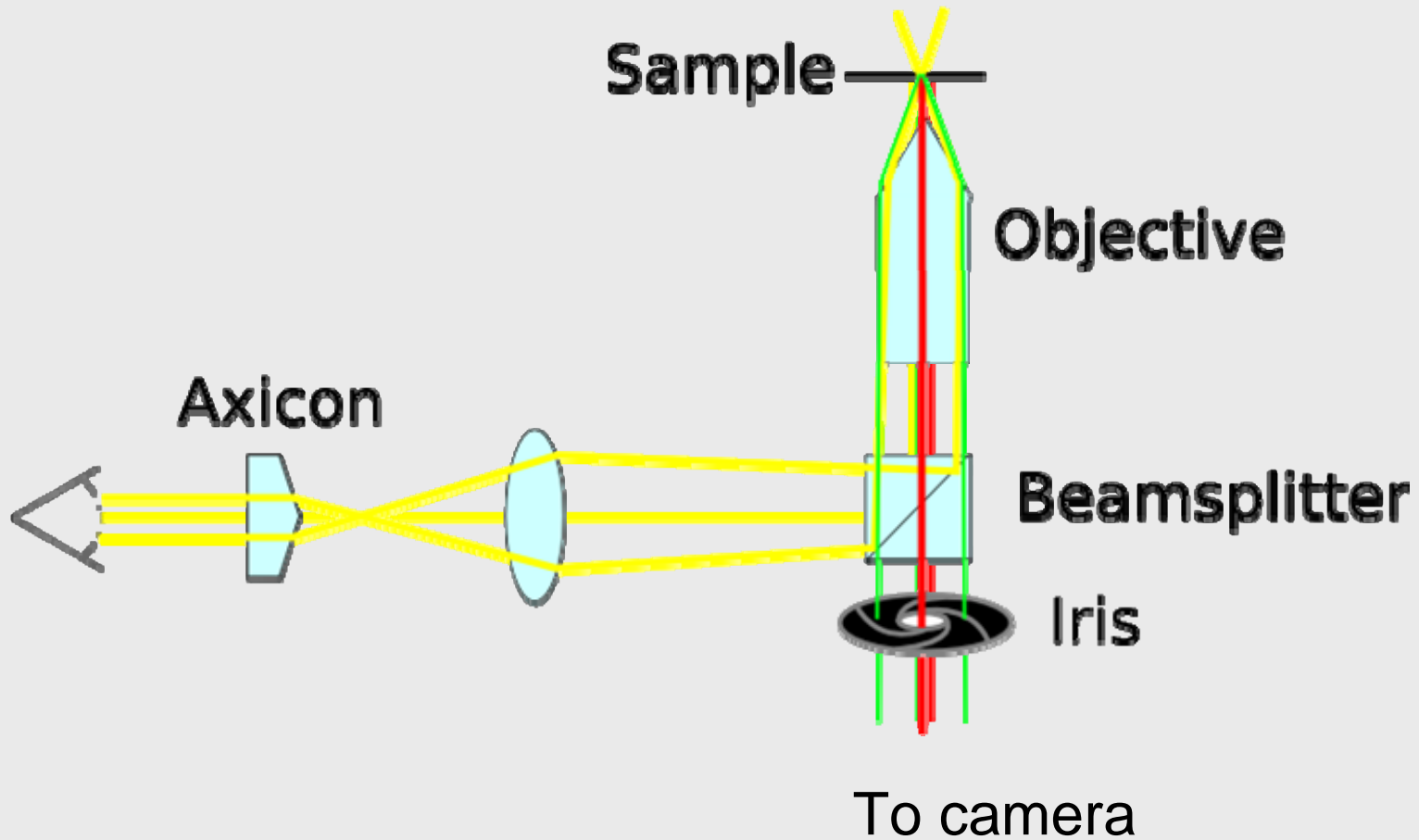
- Local enhancement of the electromagnetic field caused by oscillation of the conduction electron density at resonant frequencies
- Exhibited by conductive nanoparticles
- Frequency of light scattered depends on particle size, shape, and free charge carrier density
- Goal: to detect the plasmon resonance of single nanoparticles

Plasmon Resonance in Silver Particles

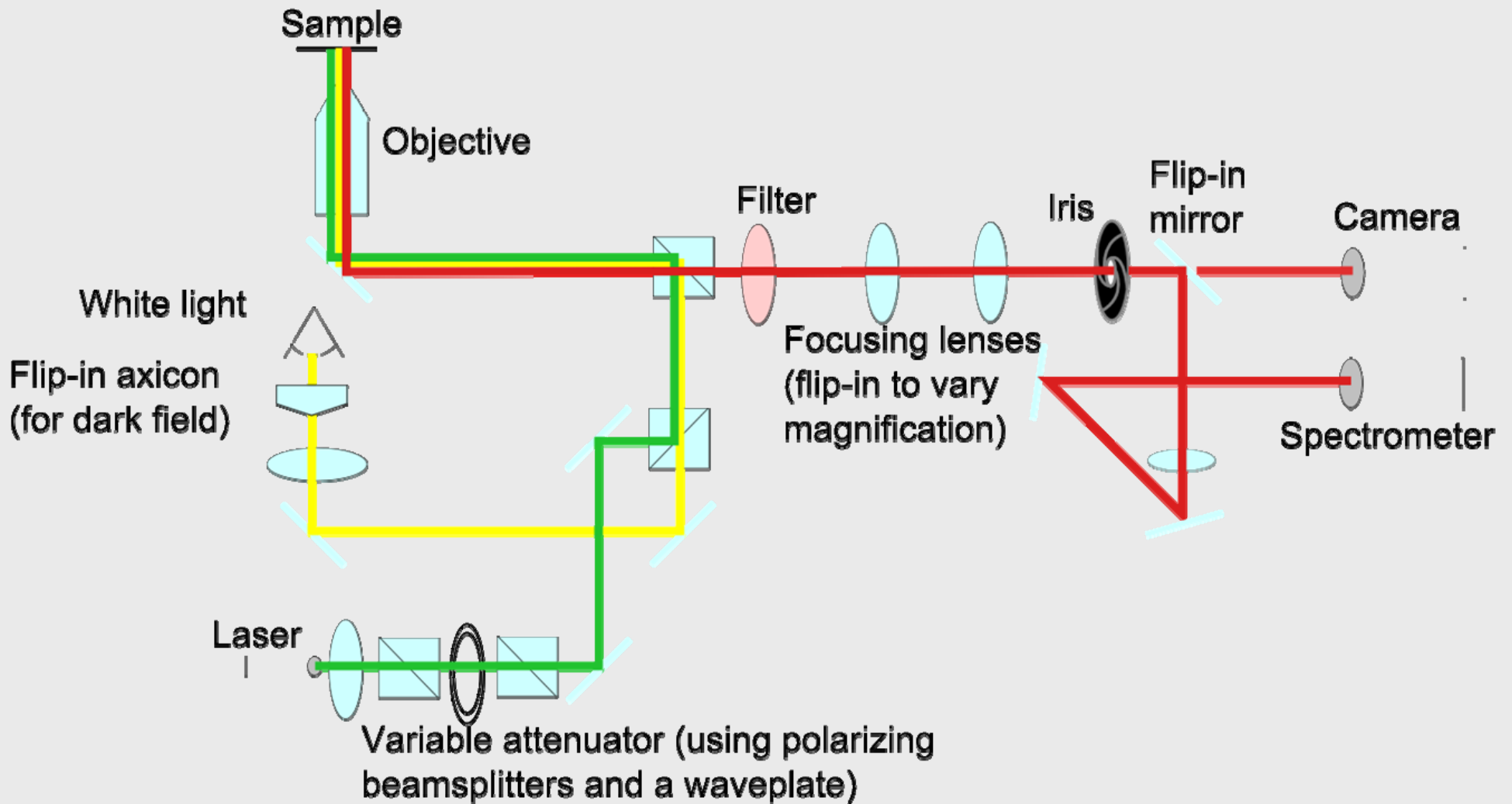


Silver particles prepared by Ali Faghieh and Professor Oded Rabin.

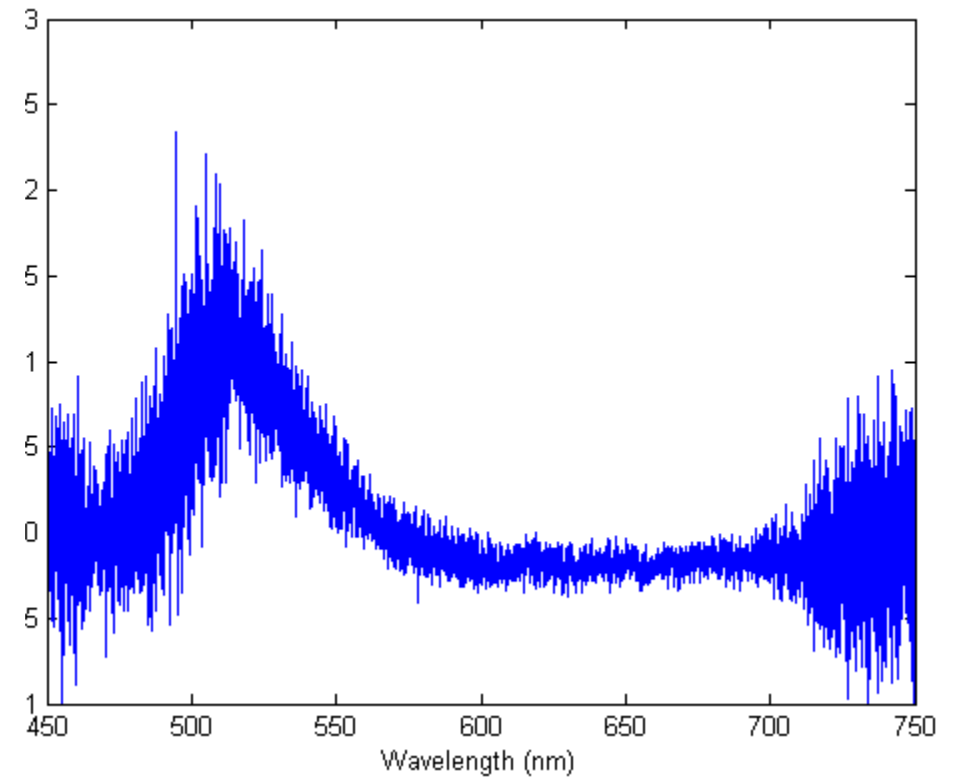
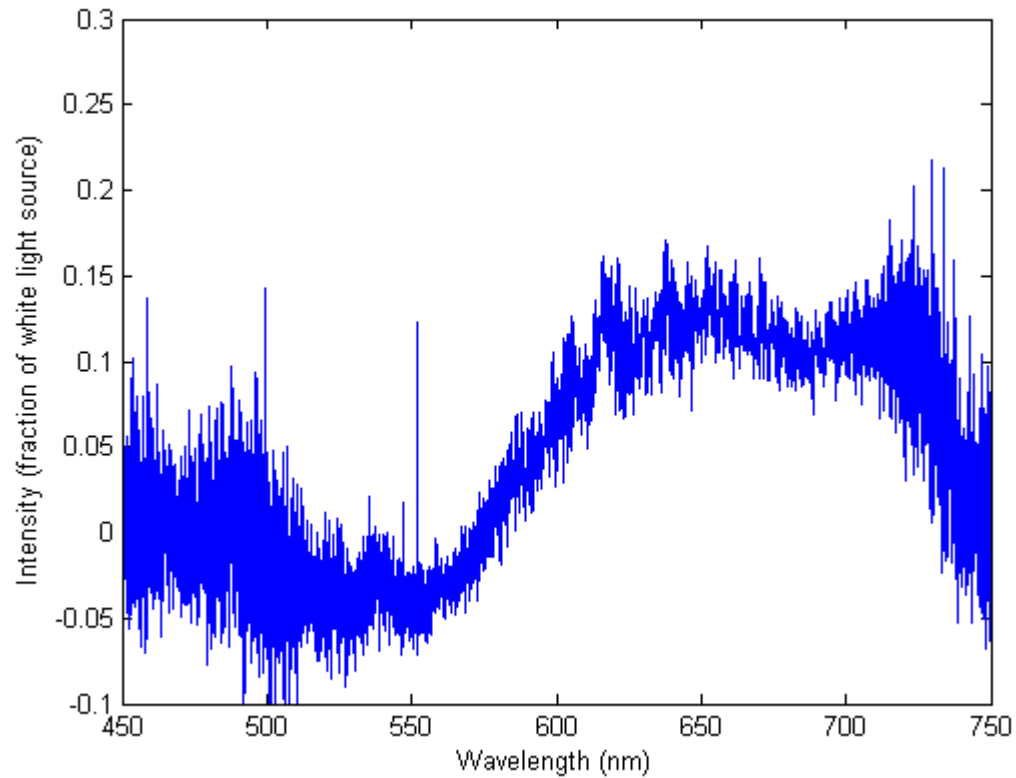
Bright Field Microscopy



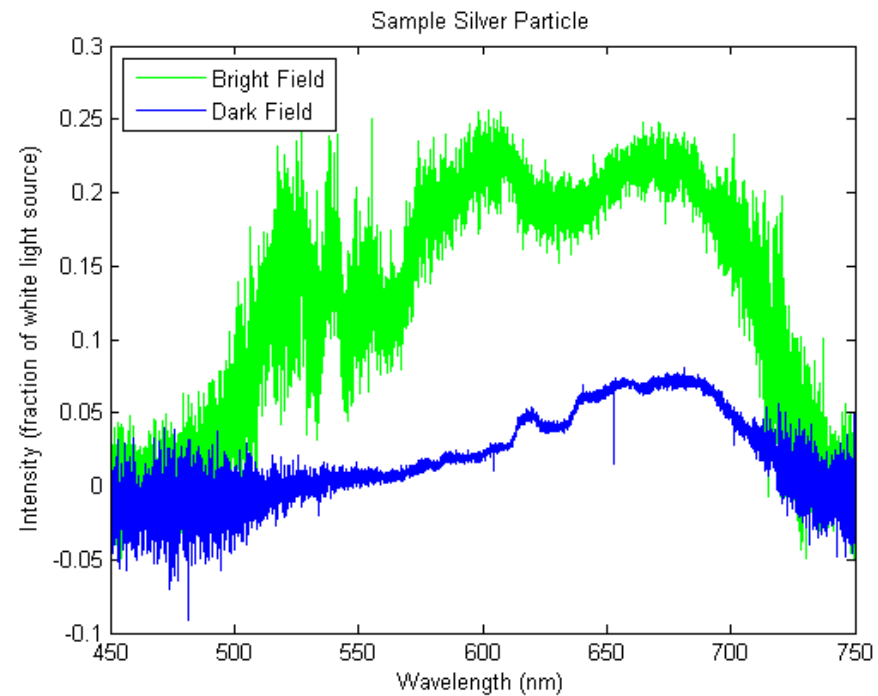
Schematic of Optical Setup



Isolated Silver Particles

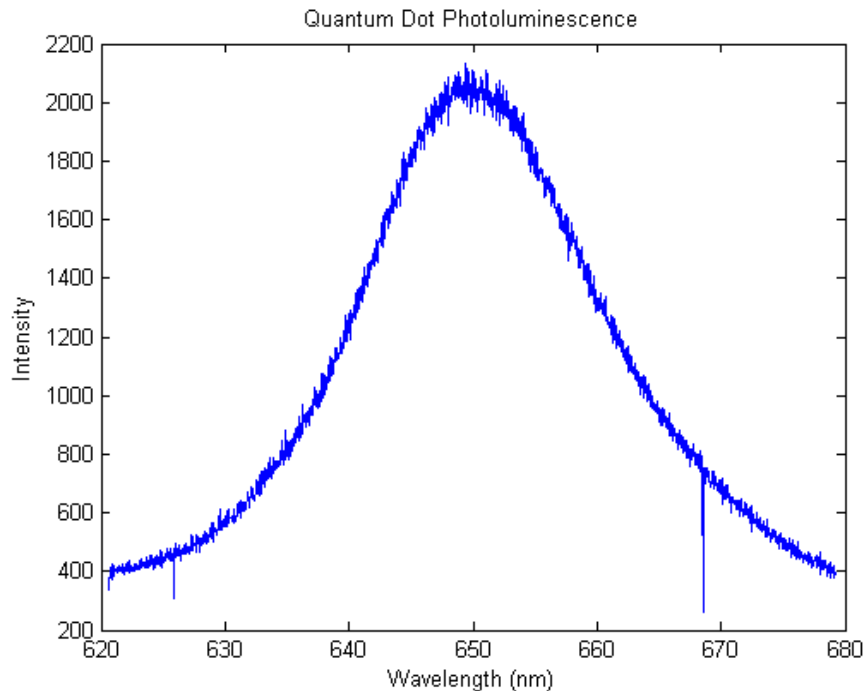


Bright vs. Dark Field



Applicability to Quantum Dots

- Photoluminescence of single CdSe quantum dot:



- Future use of this setup: detection of plasmon resonance in excited quantum dots, nanopositioning of quantum dots in cavities