Lecture on Fluorescence and Plasmonics
Supplementary Study Guide

**Introduction to Fluorescence** (8:11): [https://www.youtube.com/watch?v=SGFlr1jFNBg](https://www.youtube.com/watch?v=SGFlr1jFNBg)
- Fluorophores
- Energy states
- Wavelengths and frequencies
- Excitation and emission
- Quenching and photobleaching

**Fluorescence Spectra** (3:11): [https://www.youtube.com/watch?v=oVxpaUfTuXI](https://www.youtube.com/watch?v=oVxpaUfTuXI)
- Excitation/emission maximum
- Stokes shift and energy levels

**Jablonski Diagram:**
- Molecular absorbance/emission of light
- Electronic energy state transitions
- Radiative and non-radiative processes
- Transition timescales

**Förster Resonance Energy Transfer (FRET):**
- Donor/acceptor chromophore pair
- Nonradiative dipole-dipole coupling
- Distance dependence (< 10 nm)
- Spectral overlap
- Energy transfer efficiency

**Fluorescence Microscopy** (33:34):

**FRET Microscopy** (36:10):
  - Fluorophore structures
  - Quantum dots
  - Probe attachment chemistry

Introduction to Plasmonics (11:45): [https://www.youtube.com/watch?v=8iyShOidtYg](https://www.youtube.com/watch?v=8iyShOidtYg)
  - Light-matter interactions
  - Metallic nanoparticles
  - Electromagnetic enhancement

Plasmonics Applications (11:05): [https://www.youtube.com/watch?v=iUyPssG9f_M](https://www.youtube.com/watch?v=iUyPssG9f_M)
  - Raman spectroscopy
  - Biochemical sensing
  - Solar cells and dynamic display