THEORY AND APPLICATIONS OF
BIOL 608 LIGHT MICROSCOPY

3 credits  Spring Semester  ILSB Rm. 1143
Lectures: Wed+Fri 1-2:15 PM, flexible lab sessions

For biologists, material scientists, and students from other disciplines. Gain theoretical background and practical experience in operation of light microscopes, sample preparation, image acquisition and image processing.

Topics:
- Fluorescence Microscopy, Confocal Imaging, Multiphoton Excitation
- Brightfield, Darkfield, Phase Contrast, Differential Interference Contrast, Polarized Light Microscopy
- Principles of superresolution LM (STED, STORM, PALM, SIM, SRRF...)
- Studying molecular dynamics and interactions by fluorescence microscopy: FRAP, FRET, FLIM, Fluorescence Correlation Spectroscopy, RICS
- Image processing and analysis, deconvolution

Lab section:
- Demonstration and hands-on experience with light microscopes (wide-field, laser scanning confocal, STED superresolution, FLIM, Light Sheet)
- Full confocal microscopy training at reduced cost (optional)
- Analyzing point spread functions, resolution and optical aberrations
- Image processing and analysis

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