CHEM 5570

Luminescence Spectroscopy with Applications

James Demas (demas@virginia.edu)
TuTh 8:00AM-9:15AM CHEM 305
Fall, 2016

An introductory upper level undergraduate and graduate student level course on the basics and applications of luminescence spectroscopy. The course starts from the bottom and works up to complex topics and applications.

Topics to be covered will include:

- Fluorescence and phosphorescence

- Luminescence of organic and inorganic molecules
- Kinetics
- Quenching
- Energy transfer
- Polarization (static and dynamic)
- Excited state reactions
- Instrumental methods
- Steady state and time resolved measurements
- Quantum yield determinations
- Data analysis
- Microscopy
- Analytical applications
- Design of luminescent molecules and sensors
- DNA sequencing
- Fluoroimmunoassay
- Biodynamics
- Labeling
- Ultralow-level detection
- Environmental and bio-monitoring

Topics can be tailored for the specific interests of the students.

Text: J. Lakowicz, Principles of Fluorescence Spectroscopy, literature readings, and lectures.

There will be homework, a midterm, a final, and at least one oral presentation on some aspect of luminescence

Laser excited luminescence of a ruby. The photograph is taken entirely by the red glow of the ruby.