Luminescent Materials and Their Applications

Course information
Target audience: PhD students with research fields relevant to optoelectronics
Credit: 5 hp
Scheduled hours: 24 (6 lectures + 2 seminars)
Recommended self-study hours: 110
Duration: From September to December 2020
Location: IFM, campus Valla
Grading: Passed/Failed
Language: English
Course responsible: Xiaoke Liu (xiaoke.liu@liu.se)

Course description
Luminescent materials have played significant roles in our daily life, such as light sources and display products. This course will provide a fundamental understanding of the major types of luminescent materials and their properties as well as their applications in various optoelectronic devices.

The course consists of 6 lectures and 2 seminars. Each lecture/seminar lasts 3 hours. The lectures will cover the following topics:

- Luminescence and related photophysics
- Inorganic semiconductors
- Colloidal quantum dots
- Organic semiconductors
- Perovskites
- Light-emitting diodes
- Light-emitting electrochemical cells
- Solar cells
- Lasing

The seminars will be focused on discussions of individual written projects.

The course literature will be lecture notes, book chapters and research papers.

Examination
1. Individual written project: Write a paper (in the form of scientific article, approximately 5 pages) within the scope of this course.
2. Group project: You will be assigned one of your colleagues’ papers to read and to write review comments. You are expected to present and discuss the paper assigned during a seminar at the course.

Registration
Contact Xiaoke Liu (xiaoke.liu@liu.se) before September 10, 2020.