

Contents

Course Timetable	6
Abstracts	7
Luminescence of Chemical Compounds on (in) Ice	7
Upconverting Nanoparticles for Biomedical Applications	7
Silica nanoparticle metrology using a new dye label	8
Infrared absorption spectra and photoluminescence of aminated nanocrystalline diamond surface	8
Anisotropy Studies on Melanin Synthesis	9
NV color centre engineering in nanodiamond for cell imaging	9
Fluorescence – Course Textbook	13
I Introduction	14
Spectra	15
A. Background and Theory	15
B. Experimental	16
C. Application example – melanin spectra	18
III Quantum yield	19
A. Theory	19
B. Experimental	19
C. Application example – ThT detection of sheet structure	21
IV Lifetime	23
A. Theory	23
B. Experimental	25
C. Application example - In-vivo glucose sensing	31
V Quenching	34
A. Theory	34
1. Static quenching	34
2. Dynamic quenching	35
3. Förster resonance energy transfer (FRET)	36
B. Application – Metal ion quenching	39
VI Anisotropy	40
A. Theory	40
B. Experimental	43
C. Application example – Nanoparticle metrology	44
VII Microscopy	48
A. Systems and techniques	48
B. Application example – gold nanorods in cells	53
Acknowledgements	56
References	57