

IMPORTANT EQUATIONS / RELATIONSHIPS TO UNDERSTAND

You need to know and understand the equations that correspond to the following concepts.

1. Introduction, Scales in biology and physics (Dr. Jonas Tegenfeldt)

2. Optics on the small scale (Dr. Jonas Tegenfeldt)

- diffraction limit of optical resolution
- uncertainty of FIONA
- optical resolution of STED
- signal to noise ratio
- number of photons detected (long formula in the lecture notes)
- numerical aperture
- energy transfer efficiency of FRET

3. Fluidics, basics (Dr. Jonas Tegenfeldt)

- diffusion coefficient
- drag coefficient of a sphere
- diffusion eq $x^2 = Dt$
- dimensionless numbers: Ca, Pe, Re
- Ohm's law of fluidics
- fluidics resistance
- Young's equation
- capillary force
- mobility

4. Fluidics, Applications (Dr. Jonas Tegenfeldt)

- critical radius of deterministic lateral displacement (for integer N)

5. Nanosafety (Dr. Jonas Tegenfeldt)

6. Molecular Motors (Prof. Heiner Linke)