



DEPARTMENT OF PHYSICS

TFY4335 - BIONANOSCIENCE

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# Determination of diffusion constant and size of micro- and nanoparticles

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# 1 Introduction

## 2 Method

### 2.1 Apparatus

**2.1.1 Apparatus** Apparatus used in the ISO7 section in NanoLab at NTNU. The apparatus used in the experiment are listed below:

- Optical microscope with camera by Zeiss Primo Star
- Dark field ring filter
- 10 micrometre micropipette
- C-Chip Hemocytometer
- White paint samples, for sample A and sample B
- Erioglaucine (food dye)
- Microfluidic chip, custom made using soft lithography
- Deionized water
- Syringe pump
- Syringes
- Microtubes

### 2.2 Softwares

**2.1.2 Softwares** Softwares used in data capture and data processing:

- Zen software
- ImageJ
- TrackPy

### 2.3 Experimental Procedure

#### 2.2 Experimental Procedure

##### 2.2.1 Optical microscope calibration

1. Adjust the optical microscope using Köhler illumination principle for optimal contrast and clarity.
2. Calibrate the microscope according to the Zeiss Primo Star user guidelines.

##### 2.2.2 Tracking particles to estimate Brownian motion and diffusion constant:

- Prepare a small sample of white paint containing microparticles (latex and nanoparticles) by spreading a thin layer on a glass slide.
- Place the sample under the optical microscope.

### 2.4 Processing of data

## 3 Results

## 4 Discussion

## 5 Conclusion

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## References

- [1] First Author. *Title of the Book*. Publisher Name, Publisher Address, 2020.