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Tobias Hangleiter\*

April 24, 2025

\* A  $\text{\LaTeX}$  lover/hater

The kaobook class

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The source code of this book is available at:

<https://github.com/fmarotta/kaobook>

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The harmony of the world is made manifest in Form and Number, and the heart and soul and all the poetry of Natural Philosophy are embodied in the concept of mathematical beauty.

– D'Arcy Wentworth Thompson



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**Part I**

**A FLEXIBLE PYTHON TOOL FOR  
FOURIER-TRANSFORM NOISE  
SPECTROSCOPY**







## **Part II**

# **CHARACTERIZATION AND IMPROVEMENTS OF A MILLIKELVIN CONFOCAL MICROSCOPE**



# Introduction

5





# Characterization of electrical performance

6

**N**<sup>OISE</sup>



# Characterization and improvements of the optical path

7







# Vibration performance

8





# Conclusion & outlook

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**Part III**

**OPTICAL MEASUREMENTS OF  
ELECTROSTATIC EXCITON TRAPS IN  
SEMICONDUCTOR MEMBRANES**



## **Part IV**

# **A FILTER-FUNCTION FORMALISM FOR UNITAL QUANTUM OPERATIONS**





# **APPENDIX**



# Special Terms

**P**

**PSD** power spectral density. v