

History of Physics

Introduction

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Welcome!

- Who are you? Why did you decide to take this course?
- First course of its kind in the history of KU (I think...)
- “Trial version” – Feedback appreciated
- Cake was an old promise: velbekomme!

Dilemmas

- Internalist vs. Externalist
- Depth vs. Extension
- Which cases to choose?
Relevant at BSc, First time, Subjective preferences
- Level of expertise
- Audience: Scientists, Teachers, Historians

Intended Learning Outcomes

After having completed the course the student will be able to:

- Identify essential features of the original formulations of core theories/concepts studied in the BSc
- Apply the original reasoning to solve problems and prove theorems
- Compare the original formulations with the modern way of teaching physics topics and reflect about pros and cons of the “didactic transformation”
- Use the history of physics as a background for reflections about the philosophical and social status of this science

Practicalities

- Time
 - Lectures: Mo (13:15-15:00) We (10:15-12:00)
 - Discussions: Mo (15:15-17:00) We (13:15-15:00)
- Place
 - Aud C – NBI (Blegdamsvej)
- Absalon will be extensively used
- Exam
 - Week 14 (3-7/4)
- Course videotaped (any objections?)

Calendar

Week	
6 6-8/2	Introduction and Module 1: Newton's mathematical force (RK)
	Module 2: Mechanics in the XVIII century (RK)
7 13-15/2	Module 3: Fluid dynamics (RK)
	Module 4: Wave theory of light (RK)
8 20-22/2	Module 5: Thermal physics and thermodynamics (RK)
	Module 6: Kinetic gas theory and statistical mechanics (RK)
9 27/2-1/3	Module 7: Shaping electromagnetism (RK)
	Module 8: Maxwell's analogies (RK)
10 6/3-8/3	Module 9: Path to relativity (HK)
	Module 10: Original formulations of quantum mechanics (HK)
11 13/3-15/3	Module 11: Discovery of antimatter (HK)
	Module 12: Modern cosmology (HK)
12 20/3-22/3	Seminars 1 and 2
	Seminar 3 and external guest (André Koch Assis)
13 27/3-29/3	Seminar 4 and external guest (Eugenio Bertozzi)
	Seminar 5 and NBI historic tour
14 3-7/4	Exams

Reading material

- *Expected reading*

Excerpts of originals

1) Do **not** expect to understand everything! Reading original sources can be very challenging; don't worry, it will take some time...

2) Please formulate **at least** three questions and submit them via Absalon **no later than 24 hours** before the lecture.

- *Recommended reading*

2nd sources explaining the originals in modern terms

- *Complementary reading*

Overview of the topic/period/context

Reading materials will be available in Absalon at least one week before the module starts.

Seminars

- Ideally in pairs (individual seminars also ok)
- “Free” choice of topic. Suggestions given in Absalon
- Time frame (2 x 45 min)
- Submission of previous reading is recommended
- Questions submitted to the seminar organizers
- Groups and topics to be defined by the end of week 6

Exam

- Oral, external censor
- 10 min presentation of seminar topic + 20 min discussion on both the course and seminar topics
- Examples of exam questions will be uploaded after the end of each Module
- Weekly essays will be read by the censors before the exam to guide the examination

Aligning expectations

- The meaning of “at lære”
- Reading the originals beforehand (active learning)
- Importance of submitted questions
 - Help lecturers identify main difficulties and plan lessons accordingly
 - Structure the discussion sessions/Suggestions for exam questions
 - Feel free to ask specific and/or broad questions
- Constant/formative feedback
- Weekly essays (max 3 pages): What have I learned?

Do we have a deal?
Any objections and/or suggestions?