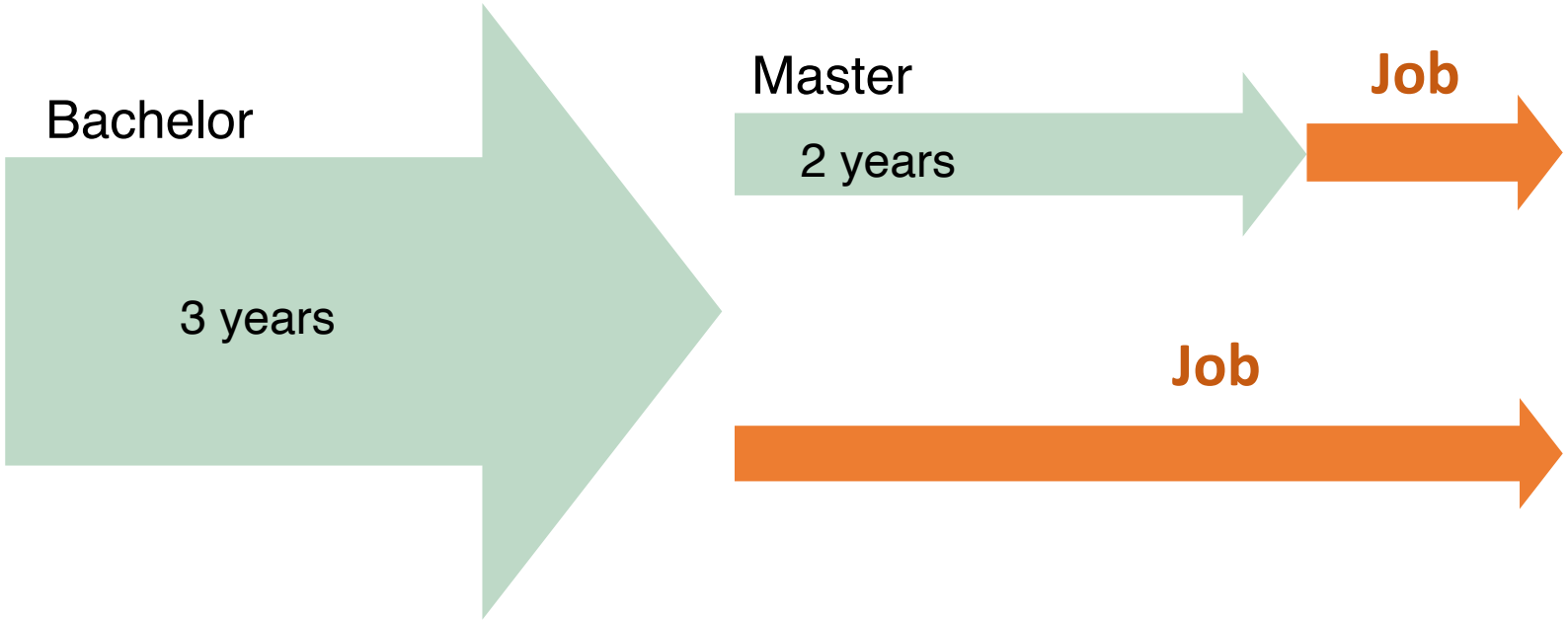
LUNDS UNIVERSITET

Study Physics in Lund

MARTIN MAGNUSSON FYSISKA INSTITUTIONEN LUNDS UNIVERSITET

Overview of the education structure



BSc programs

- **Physics**
- **Theoretical physics**
- **Astrophysics / Astronomy**

5 year degree programs

- Engineering physics / nano
- Medical physics
- Teacher physics + math

Bachelor education – 180 hp

Mandatory courses, 127.5 hp

- All mandatory courses should be taken before the thesis project
- plan courses for exchange studies

Optional courses, 37.5 hp

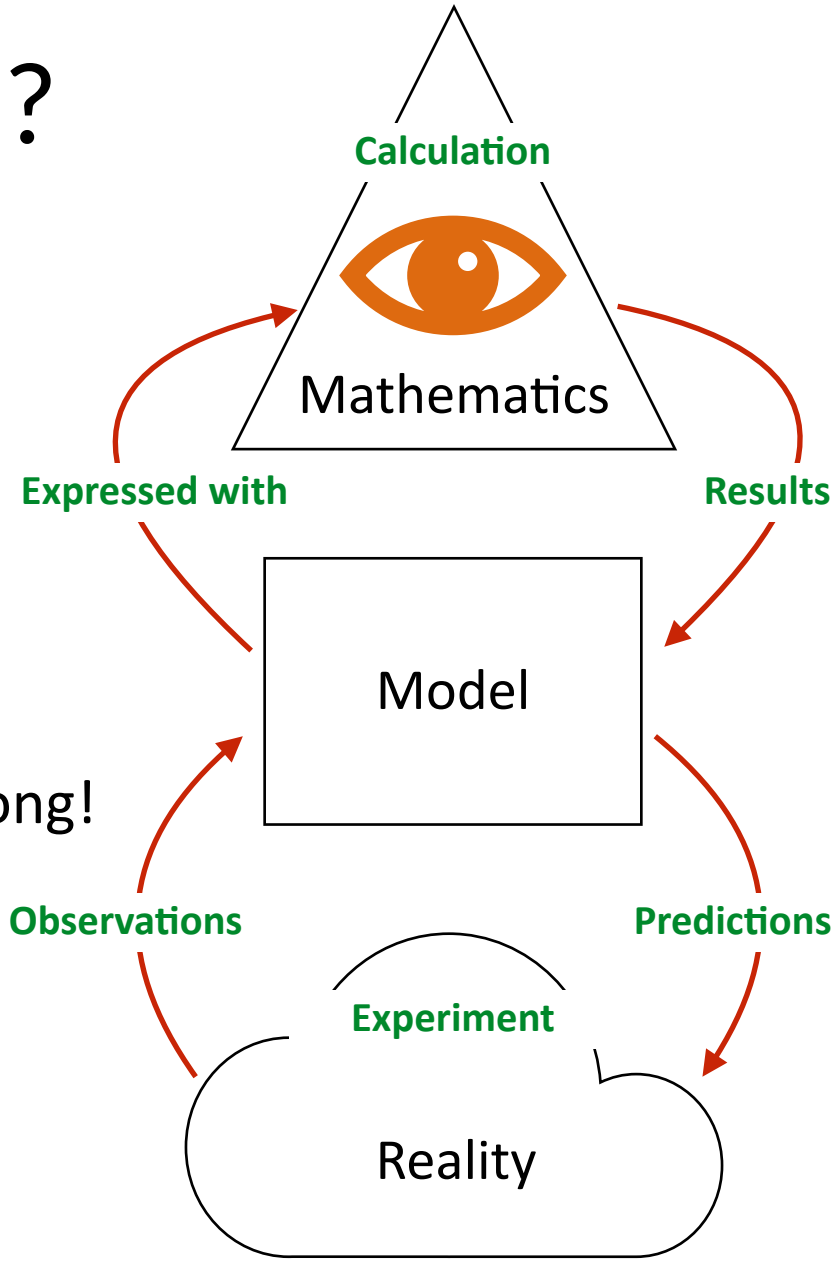
- Think about:
  - specialization, soft skills, inspiration
  - at least 7.5 hp physics here

Bachelor project, 15 hp

- First scientific essay / study

What is Physics?

- The math is always right
- Trust the math!



$$a = \frac{dv}{dt} = \frac{d^2x}{dt^2}$$

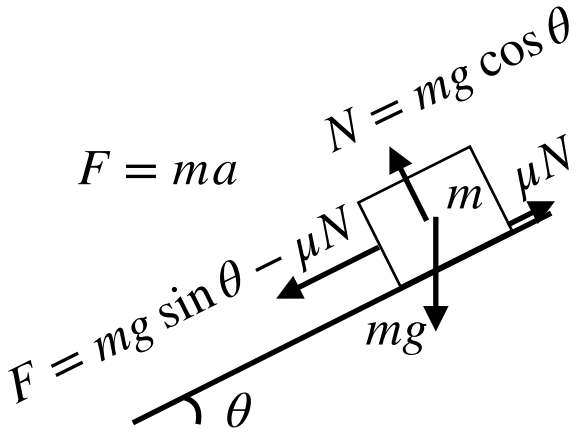
$$v = \int a\ dt = \frac{F}{m}\ t$$

$$v(t) = gt(\sin\theta - \mu\cos\theta)$$

$$x(t) = \frac{gt^2}{2}(\sin\theta - \mu\cos\theta)$$

- Bring out the essentials
- Disregard details
- Different refinement
- Sometimes the model is wrong!

$F = ma$



- Complex
- Changing
- Inexact

OPTION 1 – a flavor of physics

- **FYSB22 Basic Quantum Mechanics (7.5 hp)**
  - Fall Period 2 *(from HT27 called FYSB32)*

Requires ≥ 60 hp in mathematics…

- **FYSC20 Electromagnetism (7.5 hp)**
  - Fall Period 2 and Spring Period 2

    (from VT28 called FYSC30 and given only Spring Period 1)

Requires ≥ 75 hp in mathematics…

- **FYTB14 Classical Mechanics and Special Relativity (7.5 hp)**
  - Fall Period 1 *(from VT28 Spring Period 2)*

Requires ≥ 75 hp in mathematics…

… including specified courses

OPTION 2 – foundations of physics

- **Start from the beginning on the BSc program**
- **Take courses up to FYSB level, 45 hp**
- **Done in parallel with your other math courses**

OPTION 3 – a physics degree

- **Start from the beginning on the BSc program**
- **Take the whole BSc program**
- **You already have most or all of the math**

Current BSc program

Year 1

MATA31 Mathematics: Analysis in One Variable, (15 hp)

MATA32 Mathematics: Linear Algebra 1 (7.5 hp)

NUMA01 Numerical Analysis: Computational Programming with Python, (7.5 hp)

FYSA22 Physics: Introduction to University Physics, with Mechanics (7.5 hp)

FYSA23 Physics: Introduction to University Physics, with Electricity (7.5 hp)

FYSA13 Physics: Introduction to University Physics, with Optics, Waves and Quantum Physics (7.5 hp)

FYSA14 Physics: Introduction to University Physics, with thermodynamics, climate, and experimental methods (7.5 hp)

Year 2

MATB21 Mathematics: Analysis in Several Variables 1 (7.5 hp)

MATB32 Mathematics: Linear Algebra 2 (7.5 hp)

FYSB21 Physics: Mathematical Methods for Vibrations, Waves and Diffusion (7.5 hp)

FYSB22 Physics: Basic Quantum Mechanics, (7.5 hp

FYSB23 Physics: Basic Statistical Physics and Quantum Statistics (7.5 hp)

FYSB24 Physics: Atomic and Molecular Physics (7.5 hp)

FYSC24 Physics: Particle Physics, Cosmology and Accelerators (7.5 hp)

FYSC22 Physics: Nuclear Physics and Reactors (7.5 hp)

Year 3

FYSC23 Physics: Solid State Physics (7.5 hp)

FYTB14 Classical mechanics and special relativity (7.5 hp)

FYSC20 Electromagnetism (7.5 hp)

FYSK04 Bachelor degree project (15 hp half speed)

FYSC23 Physics: Solid State Physics (7.5 hp)

FYSK04 Bachelor degree project (15 hp half speed)

FYSC20 Electromagnetism (7.5 hp)

Fall

Spring

Last time HT26

Last time HT27

Last time VT26

Last time VT27

Last time VT28

Semester 5 can be used for exchange studies

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New Program ENFY/TEFY/ASTR

https://canvas.education.lu.se/courses/23414/pages/new-version-of-the-bachelor-programme-starting-ht2026

Term 1 HT		Term 2 VT	
FYSA30 **Light and matter**		FYSA33 **Electricity & Magnetism**	FYSA35 **Mechanics**
MATA32 **Algebra + Vector**			
MATA31 **One Dim Analysis**, 15hp		MATB32 **LinAlg**	NUMBxx **Programming concepts with Python**
Term 3 HT		**Term 4 VT**	
FYSB31 **Waves & Fluids**	FYSB32 **Basic Quantum Mechanics**	FYSC30 **Electromagnetism**	FYSC32 **Nuclear**
			FYSC34 **Particles, Cosmol. & Accel.**
MATBxx **Multivariable calculus & vector analysis for Physicists**	FYSB33 **Thermo-dyn&Stat.Physics**	FYSC31 **Atomic & molecular**	FYSC35 **Analyt. Mec. & Relativity**
Term 5 HT		**Term 6 VT**	
FYSC33 **Solid State**	Elective FYS/FYT/AST	FYSK04 **Bachelor Thesis**, 15hp	
ASTC12 **Astro**	AST choose from several	elective	Double FYSC33
FYSN27 **Quant. Mech.**	MASB13 **Mathem. Statistics**	Double ASTC12 cost?	Remaining FYSC32/34/35

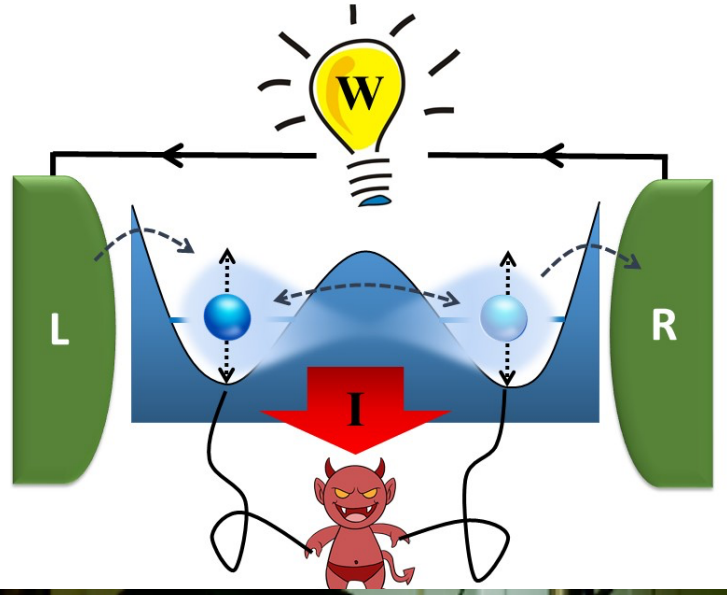
2 of 3

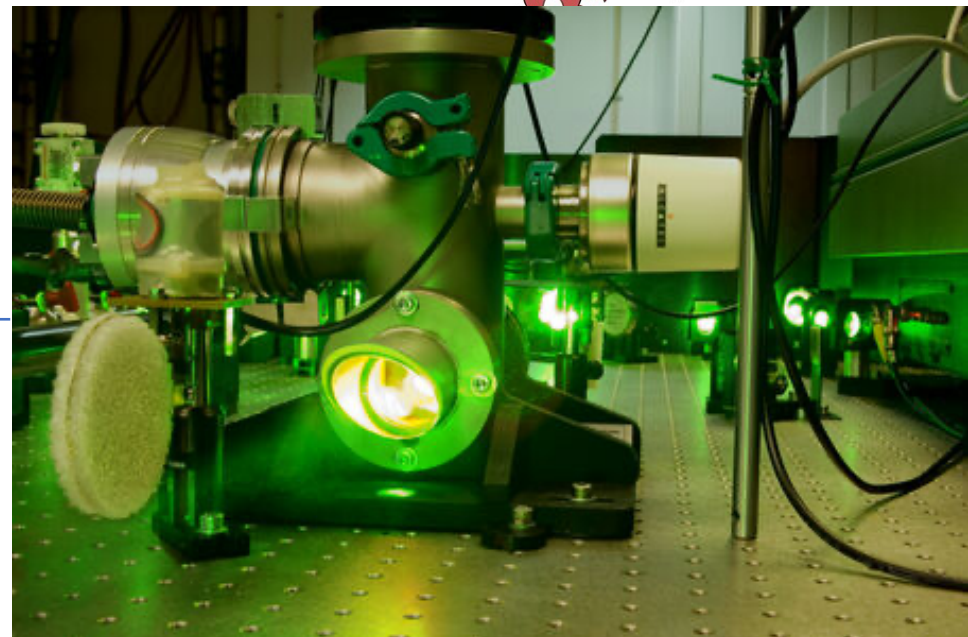
Mandat. Math. courses | Mandat. Phys. courses | relev. ASTR | elective with recommendation

Master programs in physics, 120 hp

- General Physics
- Materials Science
- Exp. Particle and Nuclear Physics
- Theoretical Physics
- X-ray and Neutron Science
- Quantum science and technology
- Astrophysics

Require 90 hp physics





- Nanoscience
- Photonics

Given by LTH

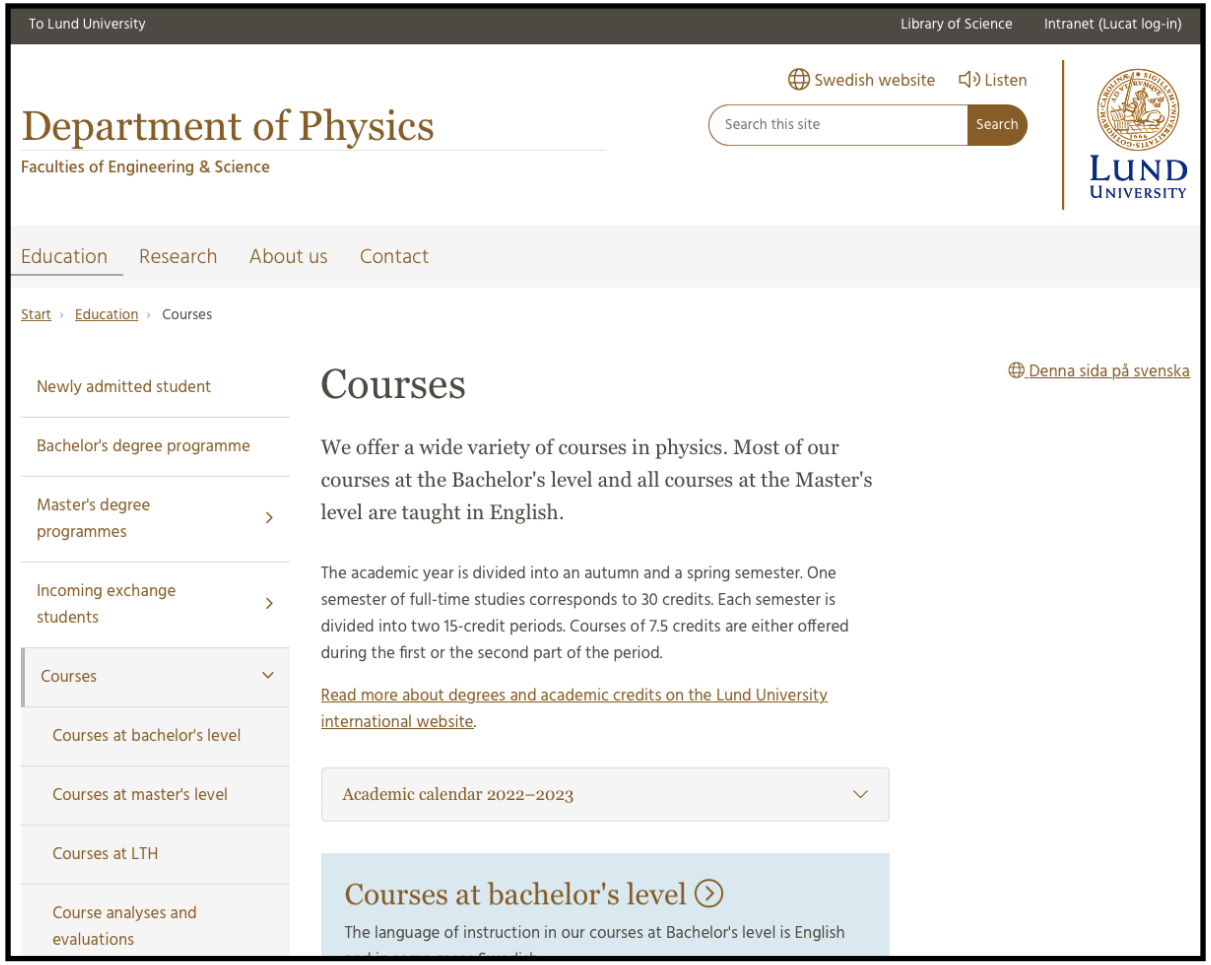
Require 40 hp physics

Elective courses

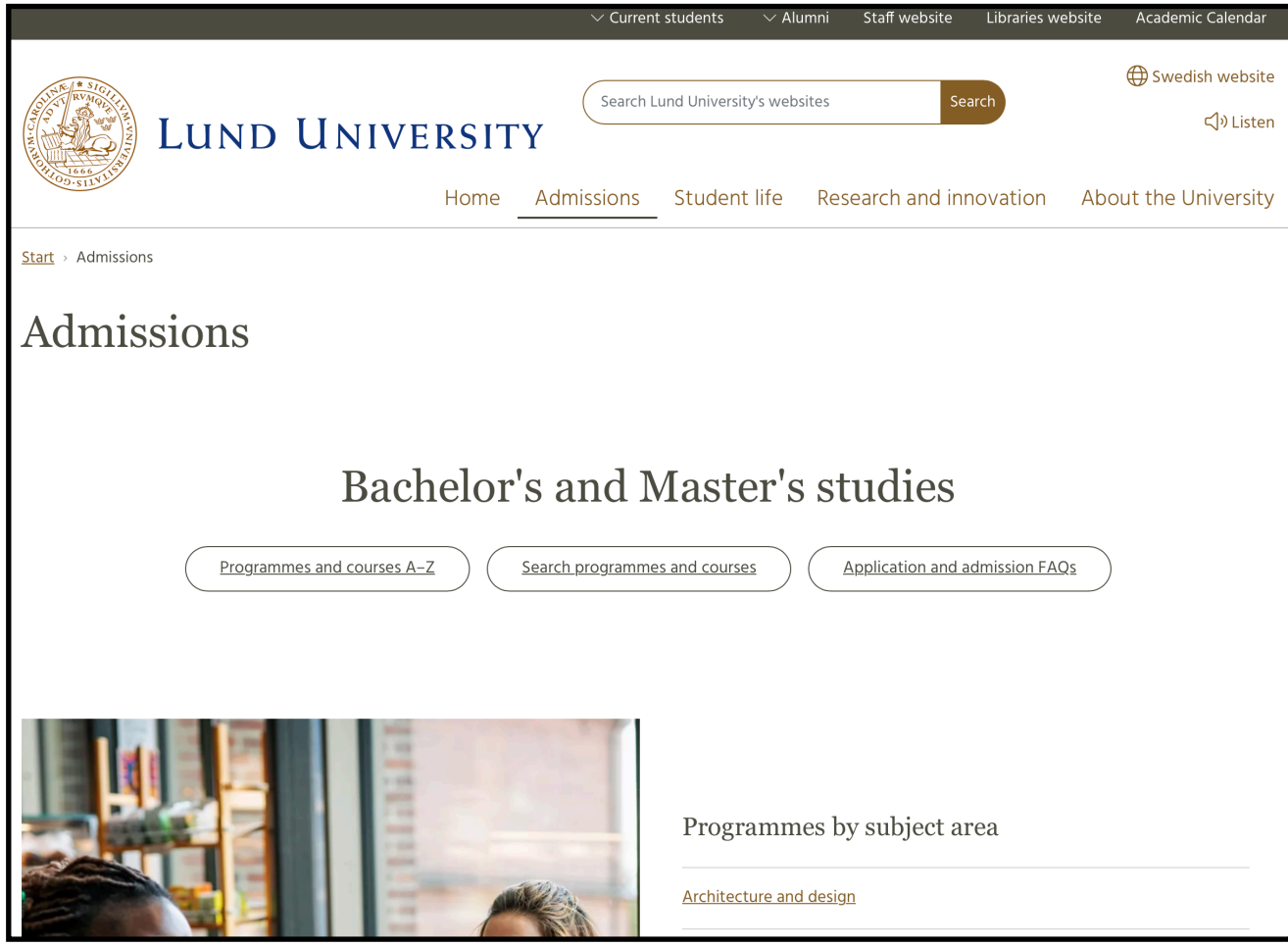
- **Some elective courses are possible to take without a physics degree**
- **Examples**
  - MAXC21, Photon and Neutron Production for Science (7.5 hp) Spring p. 1
  - FYTA14: Fluid Dynamics (7.5 hp) Spring p. 2
  - ASTC12 Astrophysics of stars (7.5 hp) Fall p. 1
  - ASTC11 Astrobiology - Conditions and possibilities for life in the Universe (7.5 hp) Fall p. 2
  - … search and ye shall find!

How to find courses

https://www.fysik.lu.se/en/education/courses



https://www.lunduniversity.lu.se/admissions



The team at Physics in Lund

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Directors of study:

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- Andreas Wacker (deputy)
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BSc program coordinator:

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MSc program coordinator:

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