



LUND
UNIVERSITY

Master's Programme in Physics, Biological Physics and Computational Biology

LUND UNIVERSITY | SWEDEN

- Master of Science in Physics
- 2 years, full-time, 120 ECTS credits
- Department of Astronomy and Theoretical Physics and Department of Physics
- Lund Campus
- Application deadline: January 2022
- Programme start: August 2022

PROGRAMME OVERVIEW

Why should physicists study biology? As a matter of fact, they already have for a long time. Biology poses many complex questions, which we cannot fully answer without understanding the rules that govern living things. Physics teaches us how to construct and apply models of phenomena in the world around us. Many renowned physicists, such as Richard Feynman, Wolfgang Pauli, Niels Bohr, Max Delbrück and Erwin Schrödinger, have turned their attention to biological problems and in some cases made substantial contributions to new fields such as molecular biology.

Biology has increasingly become a quantitative science, where scientists from different backgrounds together address a range of unresolved problems, for example, how biomolecules adopt their specific shape, how they interact in cells and how cells divide and communicate. The methods of theoretical physics, including statistical methods, machine learning, modelling and simulation, form an invaluable toolbox for approaching many of these problems.

The Department of Astronomy and Theoretical Physics offers a physics programme with specialisation in biological physics and computational biology, which combines a solid base of courses in theoretical and mathematical physics with courses in other subjects taught at the relevant departments, for example, chemistry and biology.

As a Master's student, you will become part of a vibrant research community at the Computational Biology and Biological Physics division, engaged in cutting-edge theoretical studies of biological problems in collaboration with experimental groups worldwide. The programme includes a Master's project carried out within one of the research groups.

PROGRAMME MODULES/COURSES

The programme offers a wide range of courses. Some suggested courses are Computational Physics, Theoretical Biophysics, Artificial Neural Networks and Deep Learning, Systems Biology, Statistical Mechanics and Experimental Biophysics.

At the end of the programme, you complete an individual Master's degree project corresponding to at least 30 ECTS credits.

Please see <https://www.fysik.lu.se/en/education/masters-degree-programmes/masters-programme-physics-biological-physics-and-computational-biology> for information on compulsory and elective courses.

CAREER PROSPECTS

A specialisation in biological physics will give you opportunities to pursue a wide variety of careers. Whereas some students go on to do a PhD in theoretical physics or computational biology, it is also possible to find suitable careers outside academia, for example in the fields of information and communication technology or biotechnology, where advanced programming and modelling are sought after.

In addition, MAX IV and the upcoming ESS laboratory in Lund will create new opportunities for graduates with a degree in physics, including biological physics and computational biology.

ENTRY REQUIREMENTS AND HOW TO APPLY

Entry requirements

A Bachelor's degree of at least 180 credits in physics or the equivalent. The degree must include at least 90 credits in physics. English Level 6.

How to apply

1. **Apply online:** Go to www.lunduniversity.lu.se/biological-physics. Click on "Apply" and follow the instructions for the online application at www.universityadmissions.se, the Swedish national application website. Rank the chosen programmes in order of preference.
2. **Submit your supporting documents:** Check what documents you need to submit (i.e. official transcripts, degree diploma/proof of expected graduation, translations, proof of English, passport) and how you need to submit them at www.universityadmissions.se.
- **Programme-specific supporting documents:** When applying for this programme, you must also submit a 'Summary Sheet' with your application. See the programme webpage for details.
3. **Pay the application fee (when applicable).**

Selection criteria/additional info

The selection will be based on grades awarded for previous academic courses, particularly qualifying courses, and the statement of purpose (from the applicant's 'Summary Sheet').

Tuition fees

Tuition fee SEK 145 000 per year for non-EU/EEA citizens. No fee for EU/EEA citizens. See www.lunduniversity.lu.se for details on tuition fees





ABOUT THE DEPARTMENT OF ASTRONOMY AND THEORETICAL PHYSICS

The Department of Astronomy and Theoretical Physics spans a vast range of research activities, including theoretical astrophysics, observational astronomy and theoretical particle physics. The Computational Biology and Biological Physics group applies many of the same mathematical and computational methods and tools, but to questions linked to various areas of biology. Of special relevance for the Master's programme in biological physics is the research on, for example, DNA barcoding, stem cell regulation, protein aggregation and neural network classifiers.

ABOUT LUND UNIVERSITY

Lund University was founded in 1666 and is repeatedly ranked among the world's top 100 universities. The University has around 44 000 students and more than 8 000 staff based in Lund, Helsingborg and Malmö. We are united in our efforts to understand, explain and improve our world and the human condition.

Lund is considered one of the most popular study locations in Sweden. The University offers one of the broadest ranges of

programmes and courses in Scandinavia, based on cross-disciplinary and cutting-edge research. The unique disciplinary range encourages boundary-crossing collaborations both within academia and with wider society, creating great conditions for scientific breakthroughs and innovations. The University has a distinct international profile, with partner universities in almost 70 countries.

Lund University has an annual turnover of more than EUR 880 million, of which two-thirds go to research in our nine faculties, enabling us to offer one of the strongest and broadest ranges of research in Scandinavia.

The establishment of the world-leading facilities MAX IV and European Spallation Source (ESS) will have a major impact on future scientific and industrial development in both materials science and life science. MAX IV is the leading synchrotron radiation facility in the world while ESS will feature the world's most powerful neutron source when it starts producing neutrons in 2023. These facilities together with the new University campus in Science Village will constitute a science complex and an international hub for research, education and innovation in which Lund University plays a central role.

CONTACT

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www.lunduniversity.lu.se/biological-physics

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Learn more at www.lunduniversity.lu.se

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