

Master Program in Physics of Life

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Biozentrum / University of Basel

Information: <https://www.biozentrum.unibas.ch/msc-physics-of-life>



MSc Physics of Life - overview

The MSc Physics of Life provides **research-focused training** at the interface of **physics, mathematics, engineering, and life sciences**.

The MSc Physics of Life contains **3 elements**:

Courses, practicals:

Foundations in
Physics of Life

Elective courses

30 CP – 1 semester

Research projects:

3-month-long
research project

3-month-long
research project

20 CP – 2/3 semester

MSc research project:

MSc thesis
MSc defense

40 CP – 4/3 semester

Research projects & MSc project can (but don't have to!) be done in the same group.

Research projects in the MSc Physics of Life

The MSc Physics of Life is organized by the Biozentrum, but research projects can be carried out across different Uni Basel Departments & Institutes:

Biozentrum



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Biozentrum

Physics

Chemistry

Pharmazentrum

**Mathematics and
Computer Science**

Biomedicine

**Friedrich-Miescher-Institute
for Biomedical Research**

Swiss TPH

Biomedical Engineering

Research topics in the MSc Physics of Life

Physics of Life research in Basel is both **theoretical** and **experimental**.

Macromolecular structures & biophysics

Cellular physics

Multicellular physics

Theoretical Neuroscience

Systems biology

Evolutionary Dynamics

Quantum Computing in Life Sciences

Physical instrumentation in life sciences

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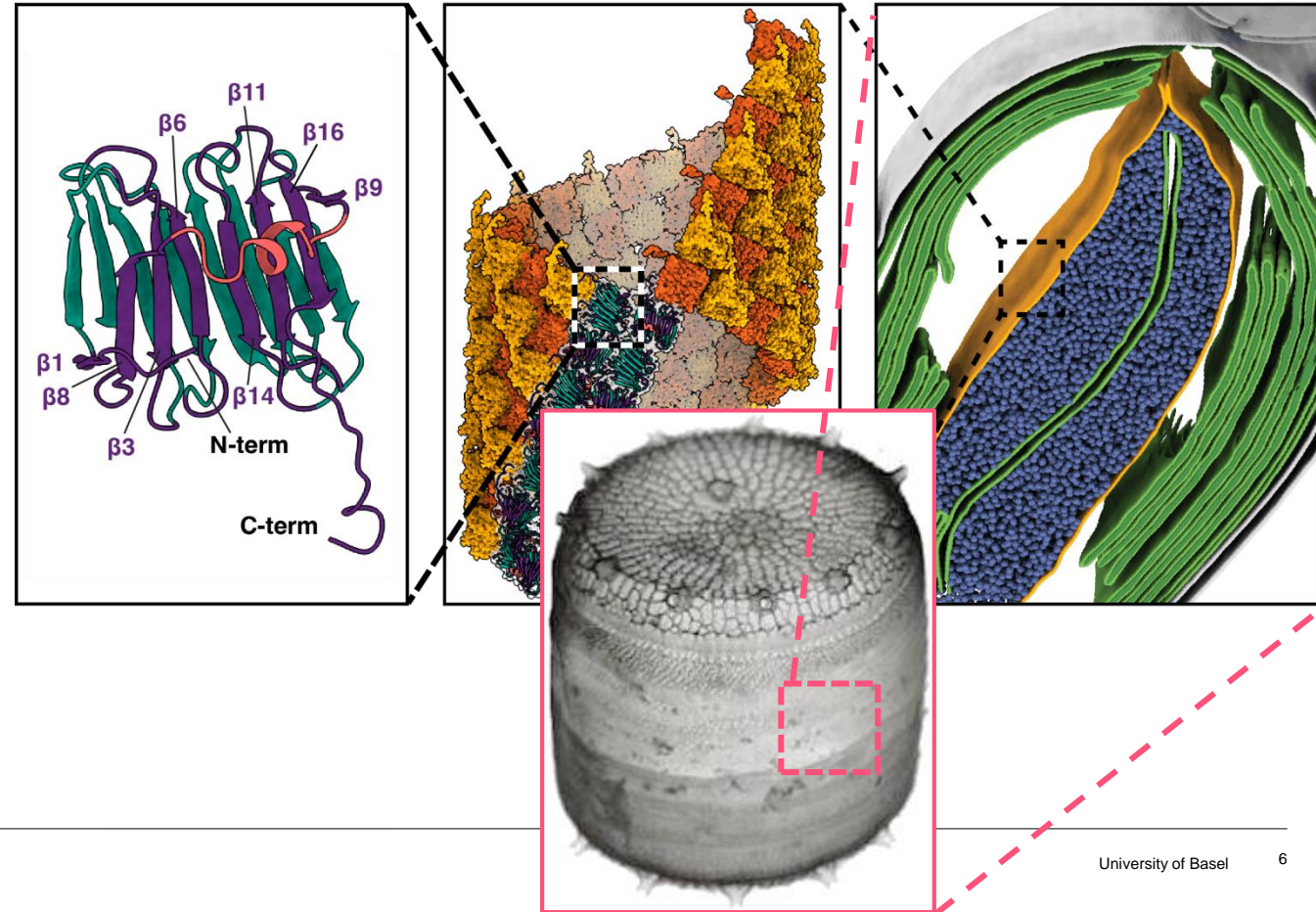
Systems biology

Evolutionary Dynamics

Quantum Computing in Life Sciences

Physical instrumentation in life sciences

From atoms to proteins to cells



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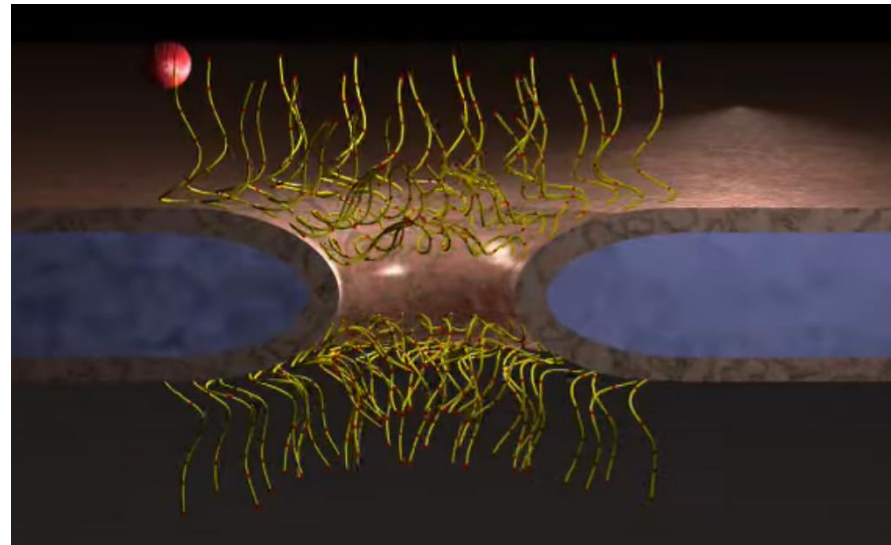
Systems biology

Evolutionary Dynamics

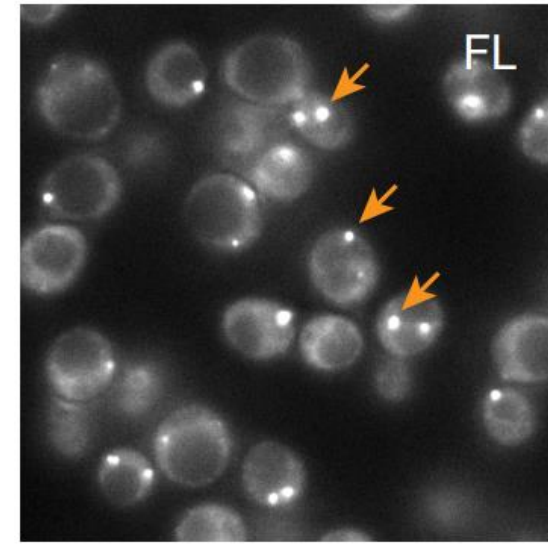
Quantum Computing in Life Sciences

Physical instrumentation in life sciences

Nuclear transport



Liquid-liquid phase separation



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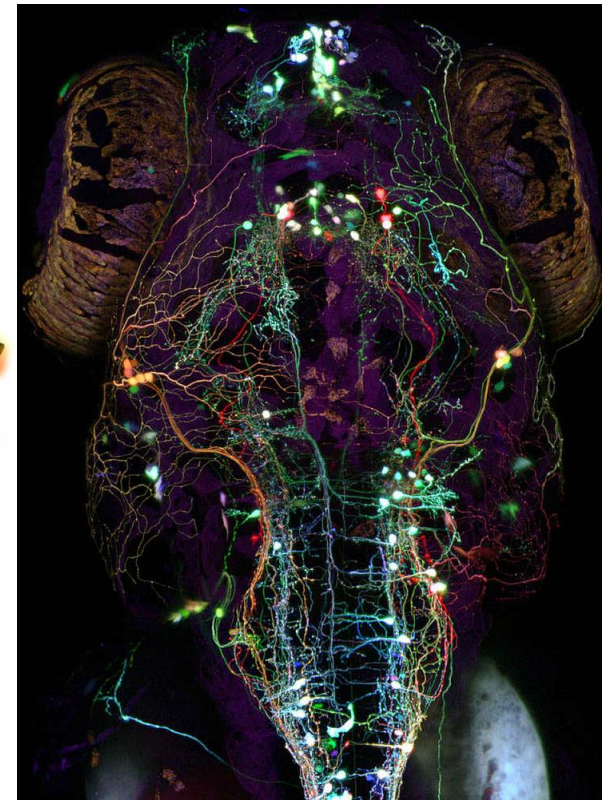
Quantum Computing in Life Sciences

Physical instrumentation in life sciences

Bacterial communities



Animal development



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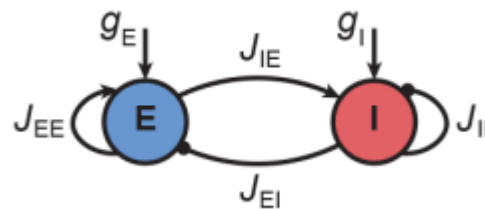
Theoretical Neuroscience

Systems biology

Evolutionary Dynamics

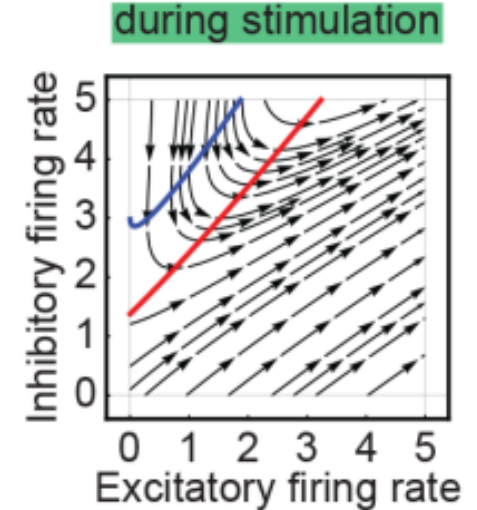
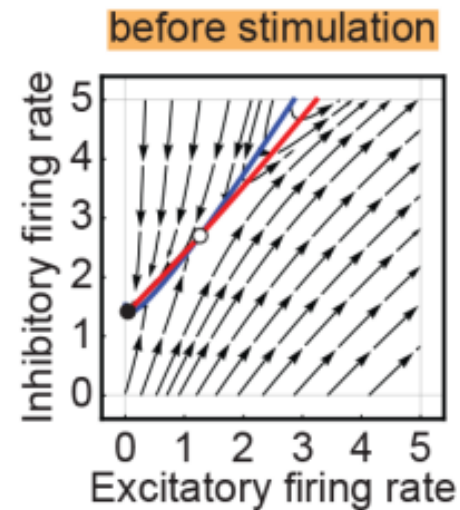
Quantum Computing in Life Sciences

Physical instrumentation in life sciences



Neural network properties

● stable ○ saddle — E-nullcline — I-nullcline



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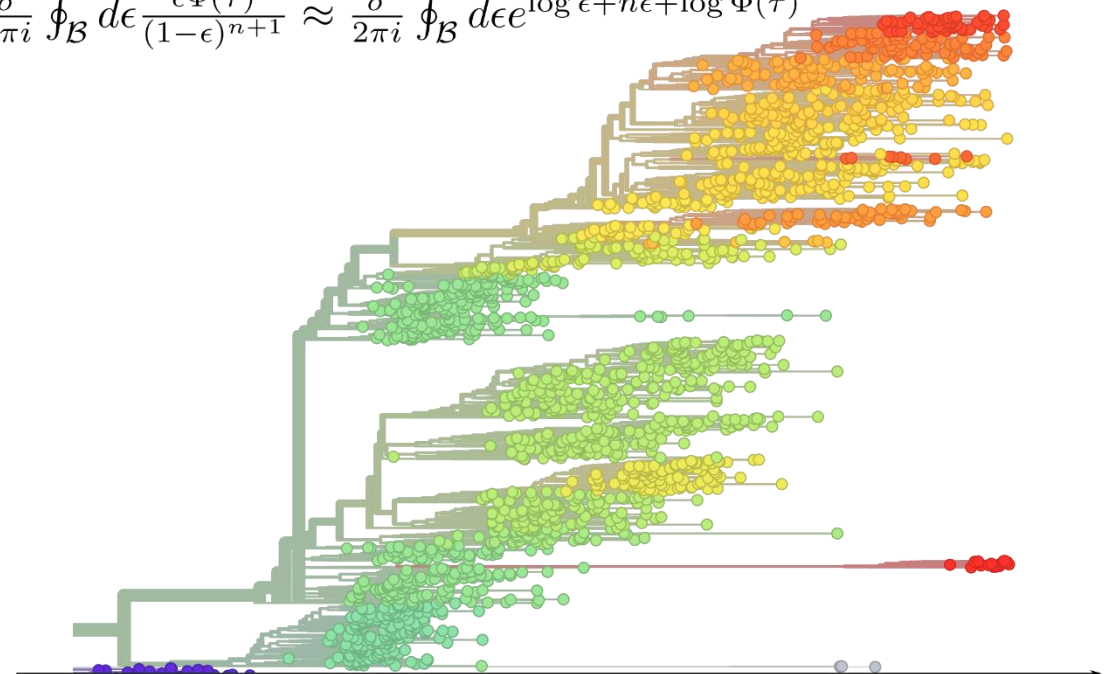
Evolutionary Dynamics

Quantum Computing in Life Sciences

Physical instrumentation in life sciences

Evolution of SARS-CoV-2

$$p(n, \tau) = \frac{\sigma}{2\pi i} \oint_{\mathcal{B}} d\epsilon \frac{\epsilon^{\Phi(\tau)}}{(1-\epsilon)^{n+1}} \approx \frac{\sigma}{2\pi i} \oint_{\mathcal{B}} d\epsilon e^{\log \epsilon + n\epsilon + \log \Phi(\tau)}$$



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Physical instrumentation in life sciences

Custom microscopy



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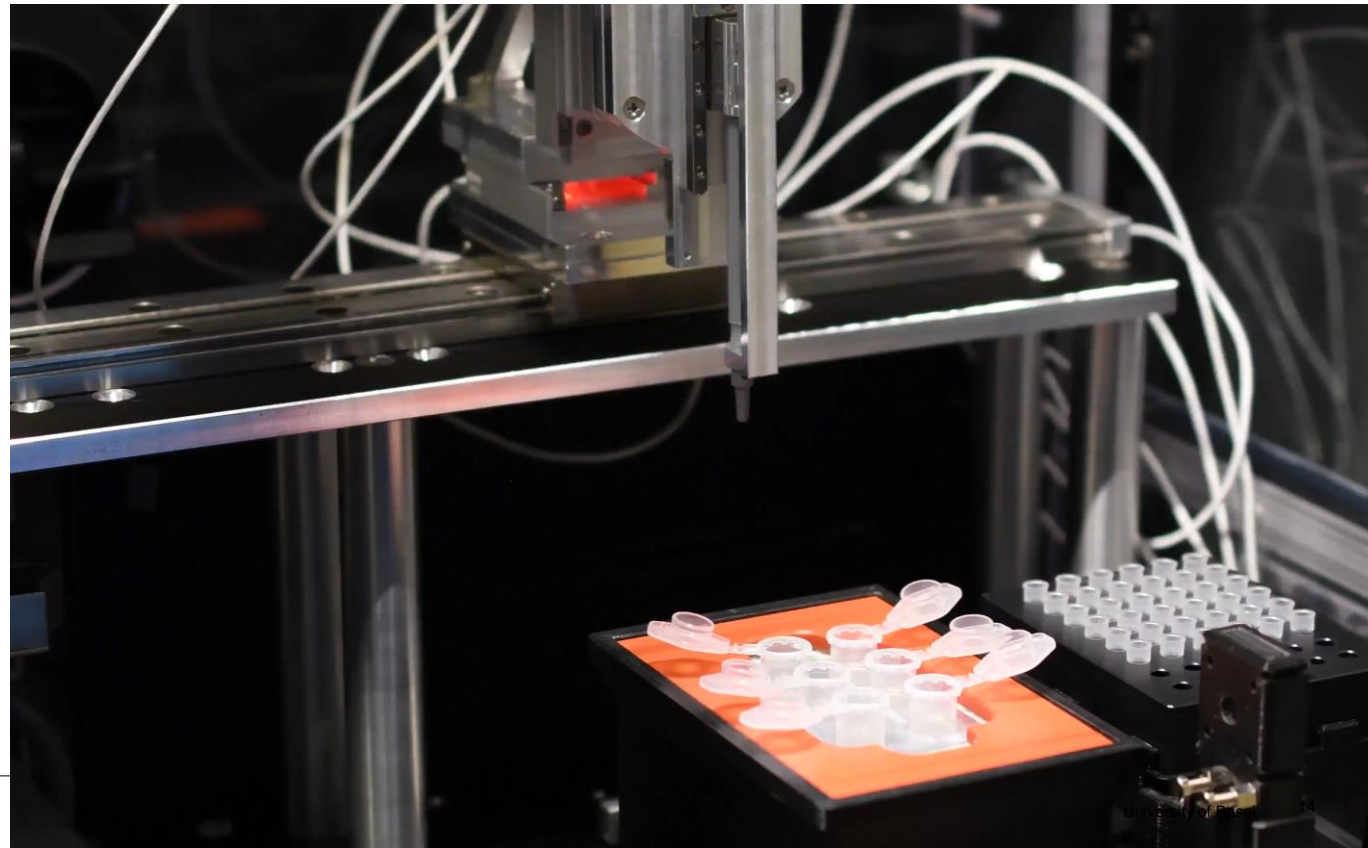
Systems biology

Evolutionary Dynamics

Quantum Computing in Life Sciences

Physical instrumentation in life sciences

Custom microscopy



Admission & key facts

Admission principle

The MSc Physics of Life is designed for students who have obtained a **strong education in mathematical methods** and/or **experimental methods in physics, chemistry, or engineering** during their BSc degree

Language

English

Duration of study

3 semesters (90 CP)

Admission requirements

The admission requires a BSc with at least 180 credit points in one of these disciplines:

- physics
- mathematics
- computer science
- computational science and engineering
- chemistry
- biochemistry
- life sciences and technologies
- mechanical engineering
- civil engineering
- electrical engineering
- micro engineering
- material science
- chemical engineering

Contat us, if you are unsure!

Job prospects and career after graduation

Pharma

Biotech

Medical Technology

Software, computation

Scientific career

PhD studies

University administration

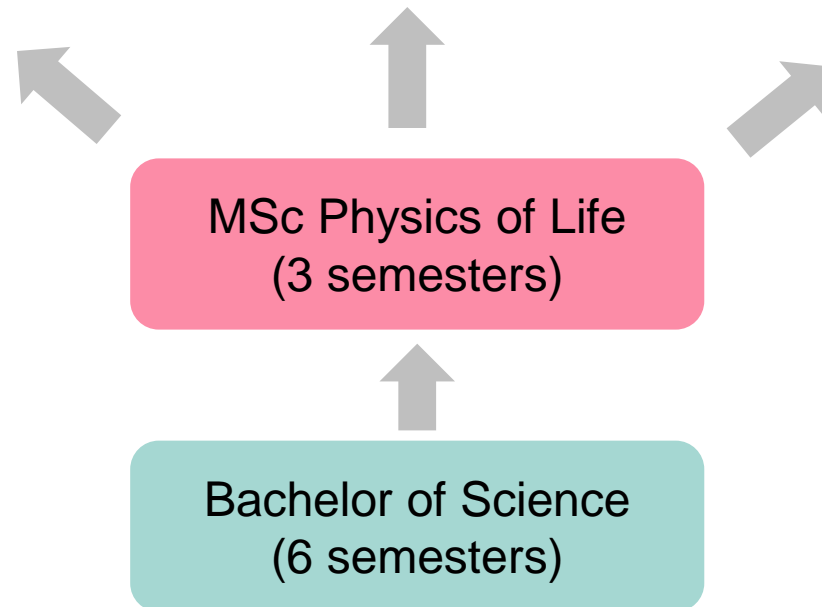
Schools

Banks

Insurances

Consulting

Patents



Detailed information about the MSc Physics of Life

<https://www.biozentrum.unibas.ch/msc-physics-of-life>



A screenshot of the website for the MSc Physics of Life program at the University of Basel. The browser address bar shows 'biozentrum.unibas.ch/education/degree-programms/msc-in-physics-of-life'. The website has a dark navigation bar with links: Home, Open Positions, Media, People, Contact, Directions, Sitemap, Search, Intranet, and language options 'en de'. Below this is a header with the University of Basel logo, the BIOZENTRUM logo (The Center for Molecular Life Sciences), and a secondary navigation bar with links: Research, PhD, Education, Facilities, News, Events, and About. The main content area has a breadcrumb trail: 'Education > Degree Programs > MSc in Physics of Life'. On the left is a sidebar menu under 'Degree Programs' with links to Overview, BSc in Biology, BSc in Computational Sciences, MSc in Molecular Biology, MSc in Physics of Life (highlighted), Diploma in Biotechnology, Graduate Teaching Program, Course Coordination, and Summer Schools. The main text area is titled 'Master of Science in Physics of Life' and contains a paragraph: 'The Master's degree program in Physics of Life at the Biozentrum of the University of Basel provides training in cutting-edge research at the interface of physics, mathematics, engineering, and life sciences. The MSc Physics of Life is aimed at students who have obtained a strong education in mathematical methods and/or experimental methods in physics, chemistry, or engineering during their Bachelor's degree.' Below the text is a rectangular image showing a colorful, abstract, crystalline or molecular structure against a dark background.

Contact persons for the MSc Physics of Life

- If you have questions about the MSc Physics of Life, please contact
 - either the study coordinator for the MSc PoL, Dr. Sarah Güthe
(sarah.gueth@unibas.ch)
 - or the head of the teaching committee for the MSc PoL, Knut Drescher
(knut.drescher@unibas.ch)
- Meet us at the Master Info Day:
 - 20 March 2025 at 17:30 in the Kollegienhaus



University
of Basel

Thank you
for your attention.