# Physics

**Degree conferred**
Scientiarum doctor in physica / Doctor of Philosophy in Physics (PhD)

**Commencement of studies**
An application for admission may be submitted at any time.

**Regulation**
http://studies.unifr.ch/go/Pm-6g *(French and German only)*

**Application procedure**
**Candidates with Swiss qualifications**
https://studies.unifr.ch/go/Ui3b4
**Candidates with foreign qualifications**
https://studies.unifr.ch/go/2KPbe

## Fribourg profile

The Department of Physics offers PhD studies consisting of a personal research project to be completed within 3-4 years. In addition to this research project Doctoral students will attend seminars and colloquia to broaden their knowledge. The research activity in the Department of Physics is both experimental and theoretical in character and focuses on the following areas:

**Solid State Physics**
The electronic and magnetic properties of novel materials are studied using photons, electrons, neutrons and muons as experimental probes. The research focuses on the interplay between magnetism and superconductivity and on understanding the electronic structure.

**Soft Matter Physics & Photonics**
Physical phenomena related to soft matter structures, scattering probes and optics in ordered and disordered media are investigated. Of particular interest are the structural/dynamical/mechanical properties of soft materials, and the development of new optical methods.

**Atomic physics**
Spin-coherent atomic assemblies are employed to probe subtle physical processes and their use in fundamental and applied physics is investigated. Inner-shell atomic processes are studied to obtain insight into atomic structure and dynamics.

**Computational Physics**
Numerical simulations and analytical techniques are used to study the equilibrium and nonequilibrium properties of strongly correlated electron systems.

**Soft Matter Theory**
The tools of classical statistical mechanics are used to investigate soft condensed matter systems. Interfacial phenomena, phase transitions and nonequilibrium states (such as colloidal glasses or sheared suspensions) are topics of current interest.

**Theoretical Interdisciplinary Physics**
Complexity in biology, the economy and the internet are studied using statistical methods. Current research is focused on the development of information filtering tools, models of interacting economic agents and investment optimization.

**Light-Matter Interaction**
First-principle simulations and advanced modeling are employed to study quantum materials out of equilibrium. The research focuses on extracting quantum properties of electrons from spectroscopy and ultrafast manipulation of matieral properties through tailored light.

PhD students will learn how to conduct a research project in an independent manner. They will also learn how to interpret scientific data and to present them. Furthermore, students are expected to think independently about their research topic and work as a team member in a research group. PhD students participate at national and international scientific meetings in order to further their knowledge and to establish a scientific network.

PhD students in the Department of Physics are remunerated according to standards of the Faculty of Science and Medicine. To register to the doctoral programme, candidates should identify a group in which they would like to carry out their PhD (see the Department's website), read some of the relevant publications and then contact the group leader to inquire about a possible opening.

## Studies organisation

**Structure of studies**

No ECTS credits can be earned.

**Doctoral school**

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**Admission**

Commencement of studies only in the Autumn Semester (September)

## Contact

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## Doc- Postdoc-portal

http://www.unifr.ch/phd