

# National Centre of Competence in Research

## "Muoniverse"



### ► Brief description

Muon science investigates and exploits the unique properties of muons – the 'heavy siblings' of electrons. Muons are elementary particles with a sensitive magnetic moment and a lifetime of only a few microseconds. These characteristics make muons invaluable probes in particle physics – enabling precision tests of the Standard Model and detailed studies of nuclear structure – and they have a central role in the investigation of novel quantum materials, including superconductors and exotic magnets. In applied research, they are used across a range of disciplines, from environmental science to energy research and archaeology. Thanks to their ability to penetrate matter and provide non-destructive insights into internal structures, muons enable applications such as imaging large structures and performing depth-resolved elemental analysis of materials.

The National Centre of Competence in Research (NCCR) "Muoniverse" brings together, for the first time, researchers from the natural, engineering and heritage sciences to con-

nect previously separate disciplines. The aim is to link muon-beam technology with particle and materials research and to develop applications in fields ranging from quantum materials to cultural heritage.

Switzerland already occupies a leading position in muon science, thanks in particular to the world-renowned muon-beam facility at the Paul Scherrer Institute (PSI), which will undergo a major upgrade between 2025 and 2028. "Muoniverse" will complement and leverage this infrastructure through a broad interdisciplinary network of 30 research groups from Swiss universities, research institutions, museums and CERN. At the same time, existing international collaborations will be reinforced.

NCCR "Muoniverse" will significantly expand the use of muons in Switzerland by developing new technologies, improving methodologies and driving innovative applications in areas such as renewable energy, environmental monitoring and cultural heritage.

### ► Facts and figures

Total funding (2026–2029): CHF 33.87 million

Federal funding (2026–2029): CHF 14.26 million

Host institutions: Paul Scherrer Institut (PSI), University of Zurich

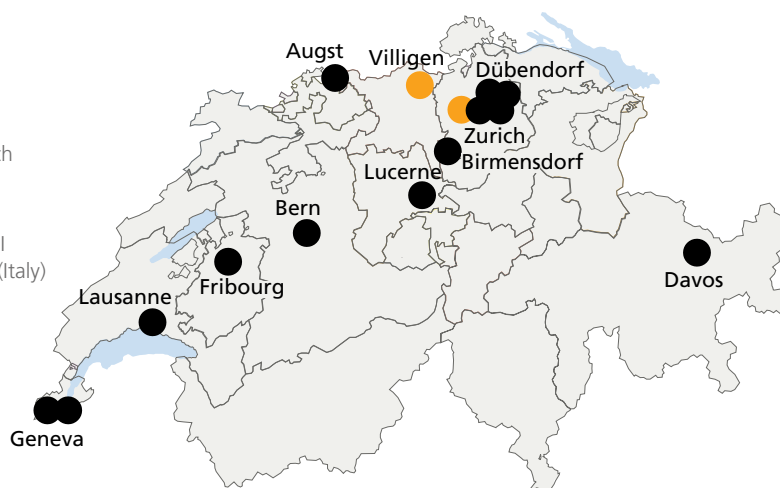
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### Further information

[www.sbfi.admin.ch/national-centres-of-competence-in-research](http://www.sbfi.admin.ch/national-centres-of-competence-in-research)

#### ● Host institutions (number of groups)

- Paul Scherrer Institut (PSI) (8)
- University of Zurich (5)

#### ● Network (number of groups)

- ETH Zurich (4)
- EPFL (3)
- University of Geneva (1)
- University of Fribourg (1)
- University of Bern (1)
- Lucerne University of Applied Sciences and Arts (HSLU) (1)
- Swiss National Museum (1)
- Zurich University of the Arts (ZHdK) (1)
- Empa (2)
- Augusta Raurica (1)
- CERN (1)
- Swiss Federal Institute for Forest, Snow and Landscape Research (WSL-SLF) (1)



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