



CAHIER D'ACTEUR

Concertation publique suisse
du Futur Collisionneur Circulaire

CHART (Swiss Accelerator Research and Technology) is Switzerland's collaboration for accelerator research and technology for CERN's Future Circular Collider. Founded in 2016 and hosted by the Paul Scherrer Institute (PSI), it brings together PSI, ETH Zurich, EPFL, the University of Geneva and CERN, with funding from SERI and the ETH Board. Around 50 researchers and engineers work in about 30 projects on superconducting magnets, the FCC-ee injector, beam dynamics, geology and geodesy.

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The point of view of CHART

In brief, what does CHART advocate?

CHART supports the realisation of CERN's Future Circular Collider. The FCC is a Swiss national science priority: it is the preferred next flagship collider of the 2026 European Strategy for Particle Physics, it is backed by the Swiss particle-physics community, and the Confederation funds dedicated programmes that prepare Swiss contributions to it. Switzerland is uniquely placed to make these contributions. Its institutes are next door to CERN, its academic landscape is excellent, and at PSI it operates world-class accelerator facilities of its own. Technology developed for PSI's X-ray free-electron laser SwissFEL already underpins the design of the FCC-ee injector. Ten years of CHART show that research for the FCC does not stay inside particle physics. It strengthens the accelerators on which Swiss researchers in biology, pharmaceuticals, materials science and physics depend, and it creates economic activity through collaboration with industry, from subsurface data in Geneva to fusion-magnet development in Aargau. The rise of compact-fusion start-ups, which draw heavily on technology developed by and people trained in the high-field-magnet programmes of particle physics, shows how such investment pays off. CHART therefore argues that the synergies and societal impact of a large particle-physics project are real and important, and that they reinforce the competitiveness of Switzerland as an innovation leader.



Why CHART supports the Future Circular Collider

A Swiss national science priority

In May 2026, the CERN Council adopted the updated European Strategy for Particle Physics, which identifies FCC-ee as the preferred option for CERN's next flagship collider. The Swiss particle-physics community, through CHIPP, supported the FCC programme in its input to the Strategy. In the 2025–2028 funding period, the Confederation funds two dedicated FCC programmes through SERI: CHART for accelerator technology and CHEF for experimental and theoretical physics. A federal evaluation committee (CSEF) has reviewed the FCC Feasibility Study and found no technical showstopper to date.

Uniquely positioned to contribute

Swiss institutes combine three assets that few countries share: geographical proximity to CERN, an excellent academic landscape, and, at PSI, a world-class accelerator facility of their own, with the Swiss Light Source SLS 2.0, SwissFEL and the high-intensity proton accelerator. The FCC-ee injector is a case in point. Its electron source is based on the SwissFEL photo-injector, and its linac structures build on SwissFEL designs. In August 2026, the P³ experiment at SwissFEL produced the first positrons for the FCC, captured by a high-temperature-superconducting solenoid of about 15 tesla built at PSI. FCC project leader Michael Benedikt acknowledged the “vital support of the Swiss CHART programme”. This is a real opportunity for Swiss technology.

Synergies for Swiss accelerator-based research

Research for the FCC directly serves the accelerators that thousands of scientists use every year at PSI for biology, pharmaceutical research, materials science and particle physics. First, high-temperature superconductors (HTS) cooled by cryocoolers instead of liquid helium can make large research infrastructures more sustainable; CHART develops such magnets to reduce the electricity consumption of FCC-ee and of other facilities. Second, high-field magnets extend the physics reach of X-ray and neutron scattering: an HTS undulator developed in CHART will extend hard-X-ray tomography at SLS 2.0 to 60 keV, and higher magnetic fields open new regimes for neutron experiments. Third, improved electron sources developed for the FCC-ee injector feed into future upgrades of SwissFEL (SwissFEL+).

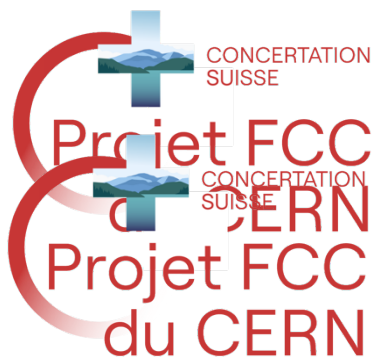
Societal impact through industry collaboration

The high-resolution geological model and subsurface database developed by the University of Geneva for FCC tunnelling are applied in a collaboration with Services Industriels de Genève (SIG) on the analysis of boreholes, knowledge that serves the region's subsurface and energy projects. In superconducting magnets, the proximity of CHART's superconducting-systems development laboratory at PSI led Proxima Fusion, a European fusion start-up, to bring its magnet R&D to Switzerland Innovation Park Innovaare, next to PSI. Some 30 highly qualified staff have come to Switzerland to develop fusion-magnet technology.

The landscape of compact, magnetically confined fusion start-ups shows the impact of past and present magnet R&D for particle physics. A large share of the people hired by these companies received their training at CERN and in partner programmes of the High Field Magnet Programme, among them PSI through CHART; Proxima Fusion is one example. Particle-physics R&D infrastructure enables the fast-turnaround development that start-ups need. And decades of open publication of results and know-how by CERN and its partners have allowed new magnet laboratories to be set up within a few years.

Conclusion

CHART supports the realisation of the Future Circular Collider and a strong Swiss role in it. The FCC is a Swiss national science priority, and Swiss institutes are uniquely positioned to make cutting-edge contributions to it. CHART's experience shows that the synergies and societal impact of a large-scale particle-physics project are real and important. Research for the FCC improves the accelerators on which Swiss science depends, generates valuable intellectual property and economic activity, and trains the people who found and staff new industries such as fusion. In this sense, the FCC reinforces the competitiveness of Switzerland, ranked first in the Global Innovation Index. CHART is committed to developing these technologies responsibly, with energy efficiency and sustainability as design criteria, and to an open dialogue with the public as the project develops.



Sources

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