



# CAHIER D'ACTEUR

Concertation publique suisse  
du Futur Collisionneur Circulaire

CHEF (Swiss High Energy Physics for the FCC) is Switzerland's national initiative for experimental and theoretical research for CERN's Future Circular Collider. It currently brings together around 40 doctoral and postdoctoral researchers working with more than 20 professors and group leaders at the Universities of Basel, Bern, Geneva and Zurich, ETH Zurich, EPFL and the Paul Scherrer Institute.

## The point of view of CHEF

### In brief, what do we advocate?

CHEF supports the realisation of CERN's Future Circular Collider. This position reflects the judgement of a new generation of Swiss researchers who are already investing their careers in the science and technology needed for the project. The 2026 European Strategy for Particle Physics reached its recommendation after more than two years of international, community-wide assessment of scientific reach, technical feasibility, cost, sustainability and the global landscape. It identified FCC-ee as the preferred next flagship collider at CERN. The integrated FCC programme combines unprecedented precision at an electron-positron collider with a long-term path to a proton collider capable of extending sensitivity to new phenomena towards energy scales up to an order of magnitude beyond those accessible today. Building it will require advances in detectors, accelerators, computing, artificial intelligence and theoretical calculations, with benefits extending beyond particle physics. CHEF is committed to pursuing these advances responsibly, treating energy efficiency, material use and environmental impact as design criteria. Continuing humanity's millennia-long effort to understand matter and the forces of nature is both a scientific responsibility and a measure of a civilisation willing to explore the unknown.

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## Why CHEF supports the Future Circular Collider

## Technology, skills and economic capacity

Frontier science creates difficult problems before commercial markets have solutions for them. The FCC programme requires more efficient accelerators and magnets, ultra-light and precise detectors, fast and radiation-tolerant electronics, advanced cryogenics, large-scale data systems, trustworthy artificial intelligence and calculations of unprecedented accuracy. Developing these capabilities trains scientists, engineers and technicians who carry rare skills into research, medicine and industry. It also creates long partnerships between laboratories, universities and companies, enabling firms to master demanding technologies and compete in new markets. Fundamental research should not be justified by promising a particular commercial product on a particular date. Its economic value is deeper: it expands the technological and human capabilities from which future innovation becomes possible. Switzerland's established strength in precision engineering, computing and research makes it particularly well placed both to contribute and to benefit.

## Sustainability must shape the design

A project of this scale must earn public confidence through responsible choices. CHEF researchers are committed to treating sustainability as an engineering requirement from the beginning, not as an afterthought. That means reducing electricity and material consumption, improving accelerator and computing efficiency, recovering and reusing energy where technically sensible, designing components for long service and circular use, and evaluating environmental impacts transparently over the full life cycle. It also means comparing alternatives honestly and continuing research that can lower the resource requirements of the final facility. The European Strategy and the Swiss community inputs explicitly recognise sustainability alongside scientific performance, feasibility and cost. CHEF will contribute by choosing and developing solutions that deliver the strongest science with the least practicable environmental burden.

## A strong Swiss contribution

The Swiss particle-physics community has reached its own position through CHIPP roadmaps and its national input to the European Strategy. These processes identified the FCC as the most compelling long-term path and stressed the value of coordinated investment in accelerators, experiments, theory, computing and people. CHEF turns that strategy into practical preparation. By connecting seven institutions and placing early-career researchers at its centre, it preserves expertise between today's experiments and tomorrow's facility. A visible Swiss contribution also strengthens the international character on which CERN depends: countries contribute different capabilities, share the resulting knowledge and collectively create an instrument beyond the reach of any one of them.

## Knowledge as a long-term public good

For thousands of years, human beings have asked what the world is made of and what forces govern it. Modern particle physics is the continuation of that endeavour, made possible by cooperation across borders and by tools that no individual nation could create alone. Progress often requires building an instrument capable of seeing what previous instruments could not. Open knowledge, technical competence, peaceful international collaboration and the willingness to investigate the unknown are public goods. Pursuing them responsibly is one measure of civilisation's success. The FCC would give the next generation the means to continue that exploration rather than inherit today's boundary of knowledge as a permanent limit.

## Conclusion

CHEF supports the realisation of the Future Circular Collider and a leading Swiss role in it. Around 40 early-career researchers and more than 20 professors at seven Swiss institutions are already building the scientific and technical foundations of this programme. The FCC recommendation emerged from a rigorous international strategy process that weighed scientific reach, feasibility, cost and sustainability. FCC-ee would transform precision studies of the Higgs boson and other fundamental particles; the integrated programme offers a credible route to direct exploration at far higher mass scales. Its demanding detector, accelerator, computing, AI and theoretical challenges will strengthen skills and innovation well beyond the field. CHEF also accepts the responsibility that accompanies this ambition: sustainable solutions must be built into technological choices and assessed transparently. The FCC is an investment in knowledge, capability and international cooperation, and in the right of future generations to push beyond today's frontier.

Sources [1] European Strategy for Particle Physics, 2026 Update, Recommendations and Deliberation Document, CERN, 2025-2026: [europeanstrategy.cern](https://europeanstrategy.cern) [2] Swiss Input to the European Strategy for Particle Physics 2026 Update, CHIPP, March 2025: [indico.cern.ch/event/1439855/contributions/6461477](https://indico.cern.ch/event/1439855/contributions/6461477) [3] CHIPP Community Roadmap 2024, Swiss Academies Reports, SCNAT: [scnat.ch/en/id/ecXuD](https://scnat.ch/en/id/ecXuD) [4] FCC Feasibility Study Report, CERN, 2025: [fcc.web.cern.ch](https://fcc.web.cern.ch)

