

Collider physics one-pager

Definition of the cluster

Following the European Strategy for Particle Physics (ESPP), Nikhef will prepare for participation in the future FCC-ee programme. This cluster will develop a strategy for Nikhef's engagement, addressing when to formalise its commitment, which proto-experiment(s) to participate in, and which instrumentation and computing capabilities to (further) develop or acquire. These choices will be guided by the physics potential of the proposed experiments, Nikhef's scientific and technological strengths, and opportunities across detector technologies, data acquisition and data processing. The cluster will also consider Nikhef's role within the emerging collaborations, with the aim of defining the scope and timing of the institute's involvement. In parallel, it will identify possible future collider opportunities relevant to the heavy-ion research programme.

This cluster will work in close coordination with the current FCC-ee group at Nikhef.

Strategic questions

- What are Nikhef's priority physics themes for FCC-ee?
- Which technology expertise do we have in-house that fits with FCC-ee, do we need new expertise?
- Which detector concepts align with our physics and technology expertise/goals?
- Which proto-collaboration(s) would we like to join?
- Which national and/or international partners could Nikhef collaborate with on detector development?
- What timeline should we adopt to have maximal impact within the chosen experiment(s)?
- How do we arrive at a large-scale infrastructure (LSRI) roadmap proposal?
- What is Nikhef's ambition for heavy-ion physics (EIC)?
- Does Nikhef have an ambition to develop accelerator technology?

Which experts should be part of the cluster

- Representatives of ATLAS, LHCb and ALICE
- Representation of Nikhef FCC-ee group
- Instrumentation experts
- MT/ET/CT representative
- Precision phenomenologists

Outcome

- Clarity on Nikhef's contribution to the FCC-ee experiments: which technologies, which detector(s) and proto-collaboration(s), which benchmark physics studies.
- A plan and timeline to arrive at a large-scale infrastructure (LSRI) roadmap proposal.
- Clarity on Nikhef's ambition for heavy-ion physics.
- Conclusion on Nikhef's ambition for accelerator technology.