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A Linear Collider Vision for the Future of Particle Physics

In this paper we review the physics opportunities at linear ee colliders with a special focus on high centre-of-mass energies and beam polarisation, take a fresh look at the various accelerator technologies available or under development and, for the first time, discuss how a facility first equipped with a technology that is mature today could be upgraded with technologies of tomorrow to reach much higher energies and/or luminosities. In addition, we discuss detectors, alternative collider modes, as well as opportunities for beyond-collider experiments and R&D facilities as part of a linear collider facility (LCF). The material of this paper supports all plans for ee linear colliders and additional opportunities they offer, independently of technology choice or proposed site, as well as R&D for advanced accelerator technologies.

This joint perspective on the physics goals, early technologies and upgrade strategies has been developed by the LCVision team based on an initial discussion at LCWS2024 in Tokyo and a follow-up at the LCVision Community Event at CERN in January 2025. It heavily builds on decades of achievements of the global linear collider community, in particular in the context of CLIC and ILC.

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