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## Initial INFN Input on the Update of the European Strategy for Particle Physics

Advancing particle physics through the development of a new accelerator at CERN represents a primary step in exploring the frontiers of fundamental science. Such an endeavour is crucial to addressing key unanswered questions in physics, including the nature of the electroweak symmetry breaking, the hierarchical pattern of fermion masses, the nature of dark matter, the unification of the fundamental forces, and the origins of the matter-antimatter asymmetry in the universe. The next-generation accelerator will not only drive groundbreaking advancements and possibly new discoveries but also consolidate CERN's and Europe's global leadership in fundamental physics, strengthening the collaborative efforts of research institutions such as the INFN. An international laboratory like CERN, with a frontier accelerator facility, at the forefront of global basic research, will enhance the role of European physics laboratories, and, in particular, of the INFN in cutting-edge research, enabling European scientists and engineers to contribute to technological innovation, deepen scientific knowledge and inspire future generations of scientists.

This document provides initial input from the INFN to the Update of the European Strategy for Particle Physics. It reflects the content and extensive discussions held during the National INFN 'Town Meeting', which took place in Rome on 6–7 May 2024 and in Milan on 4 February 2025. More detailed and independent input is being submitted by several of the National INFN Scientific Committees and Laboratories. Further input might be provided throughout the update process, in preparation of the Open Symposium planned on 23–27 June 2025 in Lido di Venezia and of the Strategy Drafting Session.

**Authors:** ZOCCOLI, Antonio (Bologna); MALVEZZI, Sandra (Universita & INFN, Milano-Bicocca (IT))