# Building the future of fundamental physics together

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## Abstract

*Over the past century, technological innovations have enabled observations on the largest scales in the universe and on the smallest scales of the matter around us. With dedicated telescopes we capture all the signals that come to us from deep in the universe and we learn about its origin and evolution. Based on the theory of general relativity, came along the Standard Model of Cosmology which describes how large objects move in the vast dimensions of space and time. With powerful accelerators, we zoom in on the structure of matter and discover the most fundamental particles. Based on quantum field theory, came along the Standard Model of Particle Physics which describes how the smallest quanta interact with each other. Both models need to be valid into even the tiniest cracks of space and time, and for all energies, even at the extremes. Being able to describe the behaviour of objects with these models does not necessarily mean we understand all the experimental or theoretical features. We know that there are problems and mysteries to address, potentially within the theoretical frameworks of these Standard Models, potentially by invoking new paradigms in physics. A portfolio of new generation experiments is being prepared to enable observations beyond the current energy and precision frontiers. The goal is to reach observations where these Standard Models break and/or to lead the way via direct discoveries of new phenomena.*