

Physics in the making

Contributed by Arnaud Marsollier
Wednesday, 02 June 2010
Last Updated Sunday, 29 August 2010

Representation of matter spreading in space credit Springel et al. /Virgo Consortium

What is the nature of dark matter? Does the mysterious dark energy accelerate the expansion of the universe? What is the mass of neutrinos? Even though with the Big Bang model, we have developed a representation of the history of the Universe, we still have questions on the distribution and evolution of matter on all scales. Astroparticles are undoubtedly one of the keys of these mysteries. The gradual mastery of their evanescent jets should lead to torrents of new concepts. But a question remains: will they consolidate our current theories or will they force us to invent a new physics, once again revolutionising our world view?

The LENA project Artist's view into the inner volume of LENA. The walls are paved with large photo-sensors / credit: ASPERA/G.Toma/A.Saftoiu

Because of dark matter, the structure of the Universe seems like a gigantic spider's web. Whether we are talking about accelerators or astroparticle physics experiments, every new revelation on the Universe's nature will profoundly change our view of matter, the Universe and their common history. For their part, projects such as LAGUNA should shed light on the secrets of neutrinos and their strange properties. Who knows if they will open a new era in physics beyond the standard model?