

# The Big Bang - Why is there matter?

When? Wednesday 31 January 2024, 16:00-18:00

Where? Botulfshörnan, Stadshallen, Lund

What happened at the Big Bang? Why did matter take over, while the antimatter disappeared? In other words: why are we here?

Physicists are increasingly interested in the neutrino, an almost massless elementary particle, which is everywhere,

to search for the fundamental asymmetry which caused matter to gain the upper hand after the Big Bang.

The neutrinos are sometimes called ghost particles, because they rarely interact with matter. It therefore requires a

giant detector to be able to "see" them – IceCube in Antarctica is perhaps the best-known example.

An international research collaboration, ESS Neutrino Super Beam, is currently working to build a huge

neutrino detector in Sweden, in the Zinkgruvan north of the lake Vättern.

By upgrading ESS in Lund, they want to send the world most powerful neutrino beam to the 1 million cubic meter large neutrino detector located hundreds of kilometers from ESS.

With the ambition to build a world-leading neutrino laboratory, ESS offers you to take part in the ESS Neutrino Super

Beam experiment ESSnuSB, a fascinating research project that can become reality in Sweden.

Program:

16:00 How can neutrinos from the ESS help us understand why there is only matter and no antimatter after the big bang?

Sampsa Vihonen, researcher, KTH

16:20 How can neutrons from the ESS contribute to finding the answer to this question? Valentina

Santoro, ESS and Lund University

16:40 How to create the world's most intense proton beam using the ESS accelerator? Mamad

Eshraqi, ESS

17:00 How can we with ESS's proton beam create a uniquely intense neutrino beam? Maja Olvegård, Uppsala University

17:20 How can we "see" the elusive neutrinos using a huge detector in a mine? Kaare Endrup Iverse, Lund University

17:40 How can we build a one million cubic meter big neutrino detector 1000 m below the ground surface and which other uses can this detector have? Tord Ekelöf, Uppsala University, EssnuSB+

The event is open to everyone. Welcome!

NOTE. The event is bilingual. Some presentations are held English, others in Swedish.