

What are the requirements for the ILC site?

It should be a site where it is possible to construct the accelerator tunnels, the access tunnels, and the large cavern that accommodates the particle detectors along a straight line with a total length of 31km (phase I) to 50km (phase II). In addition, it is absolutely necessary that they be built in stable bedrock that is free of artificial vibrations and active faults so that electrons and positrons can collide precisely.

Where is the candidate site in our prefecture for the ILC?

In Iwate Prefecture, the Kitakami Mountains (a mountain range ranging from Oshu City to Ichinoseki City at an elevation of about 100m) in the southern part of the prefecture is the candidate site for the construction of the ILC. There, a layer of hard granite bedrock^{*4} extends over a length of 50 km without any active fault.

Even during the Great East Japan Earthquake, there was no damage to the observatory facility already within a tunnel in the granite bedrock layer.

^{*4} Senmaya-Hitokabe Granite Bedrock...The Kitakami Mountains consist mainly of geological layers from the Mesozoic and Paleozoic periods, with the Senmaya-Hitokabe granite bedrock intruding in the Cretaceous Period. This candidate site is suitable for ILC construction because there are no active faults, metamorphoses, or weatherings in the area (results of a joint study from fiscal years 2010-2011 with Tohoku University).

Other Candidate Sites for the ILC

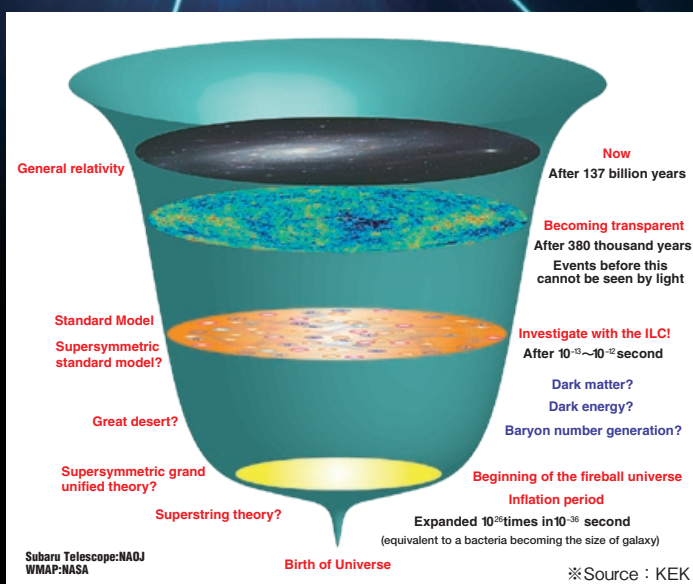
North America : Chicago suburb (Fermilab)

Europe : Geneva suburb (CERN)

Japan : The Sefuri mountains that straddle Fukuoka and Saga prefectures.

What is the academic value of the ILC?

At CERN (the European Center for the Nuclear Research), experiments to discover the Higgs particle^{*5} etc. are being conducted using the LHC (a large circular hadron collider with a 27km circumference). Just like the LHC, the ILC aims to zero in on the secrets of the origin of mass, the structure of spacetime, and the birth of the Universe by colliding particles. The ILC and the LHC will carry out their studies complementing each other and taking advantage of their own merits.



[Glossary]

^{*5} Higgs Particle...A particle that is thought to fill the Universe just as water fills the sea, and gives mass to elementary particles. Just after the Big Bang, all particles were massless. When the Universe expanded and cooled, the sea of the Higgs field was formed, and it became difficult for the particles to move around, because of the resistance from the sea. It is thought that this difficulty in moving led to the mass of particles.

Even though it has not been discovered yet, CERN announced in December 2011 that hints of the Higgs particle have been observed. The quick discovery of the Higgs particle is highly anticipated since it acts as a strong incentive to build the ILC.