

## **EISCAT\_3D, the new Arctic radar for space weather research gets go-ahead for construction**

A new international research radar called EISCAT\_3D was given the green light to proceed this month, promising a step-change in understanding the effect of solar storms and space weather on the upper atmosphere in the Arctic, including the magnificent Northern Lights. At a total cost of 685 million Swedish crowns, the EISCAT\_3D facility will be distributed across three sites in Northern Scandinavia - in Skibotn, Norway, near Kiruna (Kaiseniemi) in Sweden, and near Karesuvanto in Finland. Each site will consist of about 10,000 antennas fed by a powerful 5 MW transmitter at Skibotn and a receiver at each of the three sites. The EISCAT\_3D project will start in September 2017 with site preparations to begin in summer 2018. The radar is expected to be operational in 2021.

EISCAT\_3D will be the world's leading facility of its kind, offering a critically important window to the upper atmosphere and the near-Earth space in the European Arctic. The system will be built by the EISCAT Scientific Association, primarily comprising research councils and national institutes from Finland, Norway, Sweden, the United Kingdom, Japan and China, with additional members from several other countries. EISCAT\_3D is the culmination of a 10-year design and preparation phase, supported by the European Union. The selected design is a sophisticated phased-array radar which brings together new capabilities never before combined in a single instrument. As the name suggests, a key capability is to measure a 3-D volume of the upper atmosphere, in unprecedented detail. This is necessary to understand how energetic particles and electrical currents from space affect both the upper and the lower atmosphere (e.g. space weather, auroral phenomena and climate change) as well as man-made technologies such as satellites and power grids on the ground.

Dr. Craig Heinselman, EISCAT Director says,

“We are very excited to be starting construction of the new EISCAT\_3D radar system. Building on over three and a half decades of scientific observations with the legacy EISCAT radars, this new multi-site phased-array radar will allow our international user community to investigate important questions about the physics of the near-Earth space environment. The radar will make measurements at least ten times faster and with ten times finer resolution than current systems. It will also provide fundamentally different measurements which are unique in the scientific world by utilizing, initially, fully flexible receive arrays at two separated locations in the Nordic region in concert with the core transmit/receive array. These systems will let us probe phenomena such as the aurora borealis in three dimensions and, in concert with a variety of other measurements, will allow us to uncover the fundamental effects of phenomena such as space weather. EISCAT\_3D uses modern analog and digital technologies that enable flexibility now and a path forward for implementing new ideas that emerge from future discoveries. It truly represents a platform for the next generation of space scientists to build upon.”