



## **Highlights of recent EISCAT research and implications to the EISCAT\_3D science case**

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The year 2011 marked the 30-year anniversary of incoherent scatter measurements by the tristatic EISCAT UHF radar. Despite the long history and tradition in ISR experiments, recent years still show appearance of novel science and new innovative experiment design. The present EISCAT facilities include the UHF and VHF radars, as well as the Heating Facility and dynasonde in Tromsø, EISCAT Svalbard radar with 2 antenna dishes and a dynasonde in Longyearbyen, UHF receivers in Sodankylä and Kiruna and an EISCAT\_3D demonstrator receiver in Kiruna. Moreover, the EISCAT users have installed significant new instrumentation to be used together with EISCAT, such as the Japanese Lidar observatory and Norwegian MORRO radar in Tromsø, interferometry receiver in Svalbard operated in a Norwegian-British-Swedish collaboration, and the Finnish KAIRA wide-band astronomy and EISCAT\_3D demonstrator receiver in Kilpisjärvi, just to mention a few. We review the multiple recent science highlights and method developments based on all of the EISCAT facilities and the related and upgraded instrumentation. At the time of writing, the ESFRI Roadmap infrastructure project, EISCAT\_3D, is still in a preparatory phase. We will point out implications to the science case of EISCAT\_3D by the recent EISCAT science highlights.