



## Greenland Telescope (GLT): Imaging the Black Hole Shadow

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M87 is a promising candidate to reveal the shadow image of its supermassive black hole at its galactic center. Greenland Telescope (GLT) project [1] is aiming to image the black hole shadow for the first time using submillimeter-wave very long baseline interferometry (submm-VLBI) technique together with other submm telescopes all over the world, especially with the Atacama Large Millimeter/submillimeter Array (ALMA), the James Clerk Maxwell Telescope (JCMT), and the Submillimeter Array (SMA), to achieve micro-arcsecond resolution, powerful enough to resolve the black hole shadow.

We chose the summit of the Greenland ice sheet as the GLT site, because conditions are expected to have low submillimeter opacity, and because its location offers favorable baselines to existing submillimeter telescopes for VLBI, especially with ALMA, which extends the north-south baseline length to more than 9000 km. Our site testing results using a 225 GHz tipping radiometer indeed confirmed that the GLT site is a good submm astronomy site, similar to the ALMA or South Pole sites [2].

The GLT antenna is the 12-m ALMA North America prototype antenna, and has been retrofitted for the extreme weather. In the past two years, we have successfully deployed the antenna to Thule, Greenland [3]. This location is to commission and test the antenna before it will be brought up to the summit of the Greenland ice sheet. The three receivers (86 GHz, 230 GHz, and 345 GHz) have been installed in the receiver cabin, and the first astronomical light has been detected on December 2017, and the first astronomical fringes have been detected on March 2018. After a thorough commissioning process, we successfully joined the Event Horizon Telescope (EHT) 230 GHz VLBI observations on April 2018, which was to observe M87 with submm telescopes all over the world using submm-VLBI technique. We also joined the Global Millimeter VLBI Array (GMVA) 86 GHz VLBI observations at the same time.

In this presentation, I will give the current status and the future plan of GLT.

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