Radio antenna on Greenland

Kellyville, Greenland

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DTU Space
National Space Institute

Astro science talk, 2016/04/05

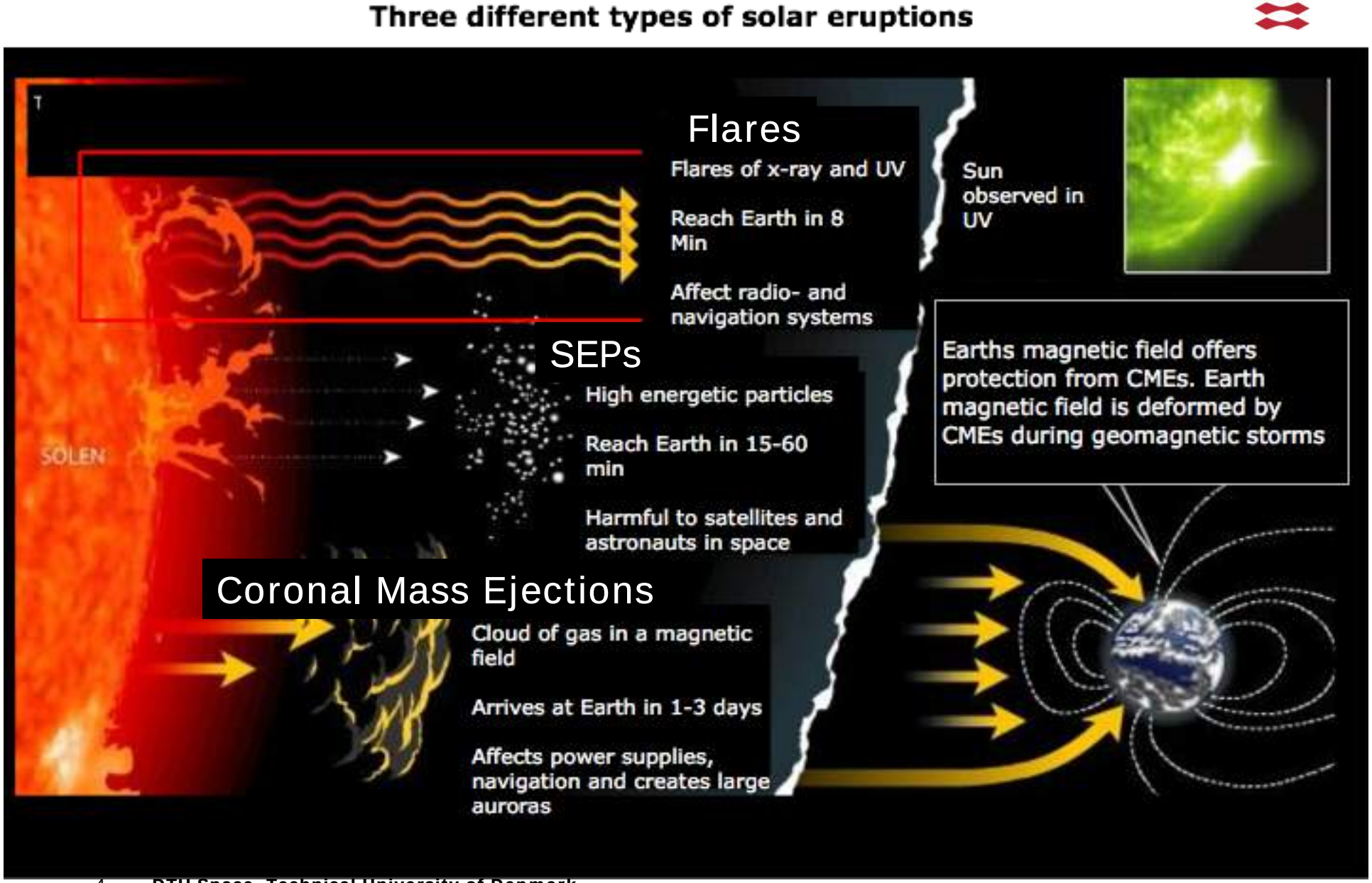
Where is Kellyville?

Close to Kangerlussuaq, 100 km from the coast.

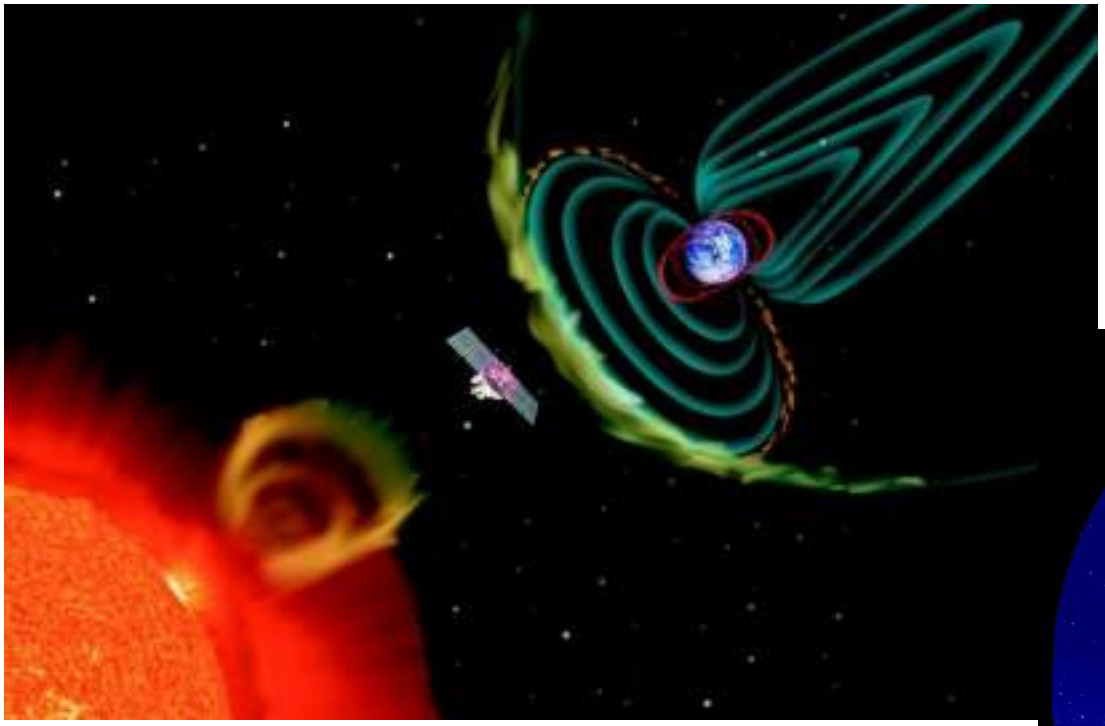
Kellyville by night

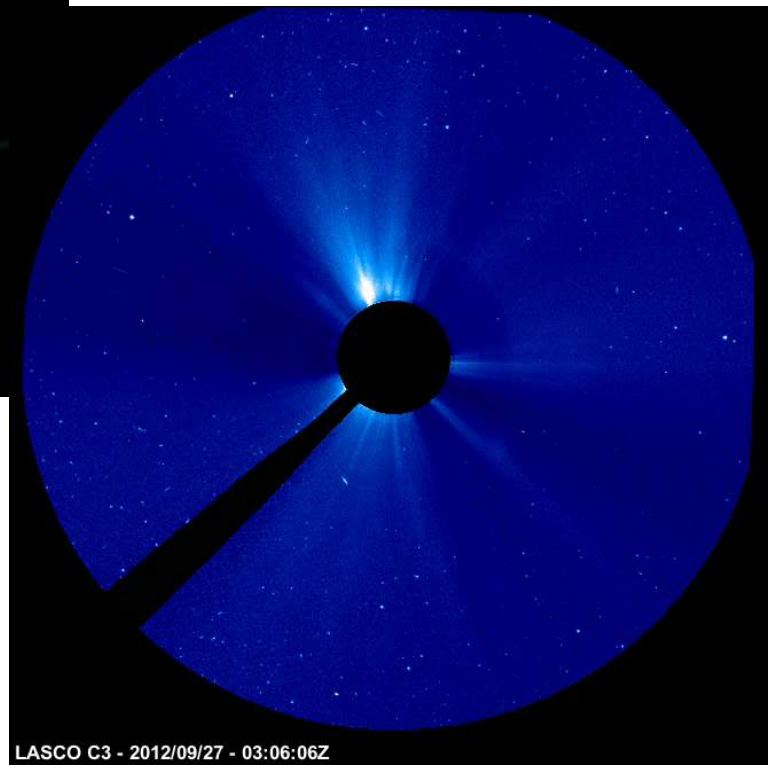
Photo: John Jørgensen

Space weather

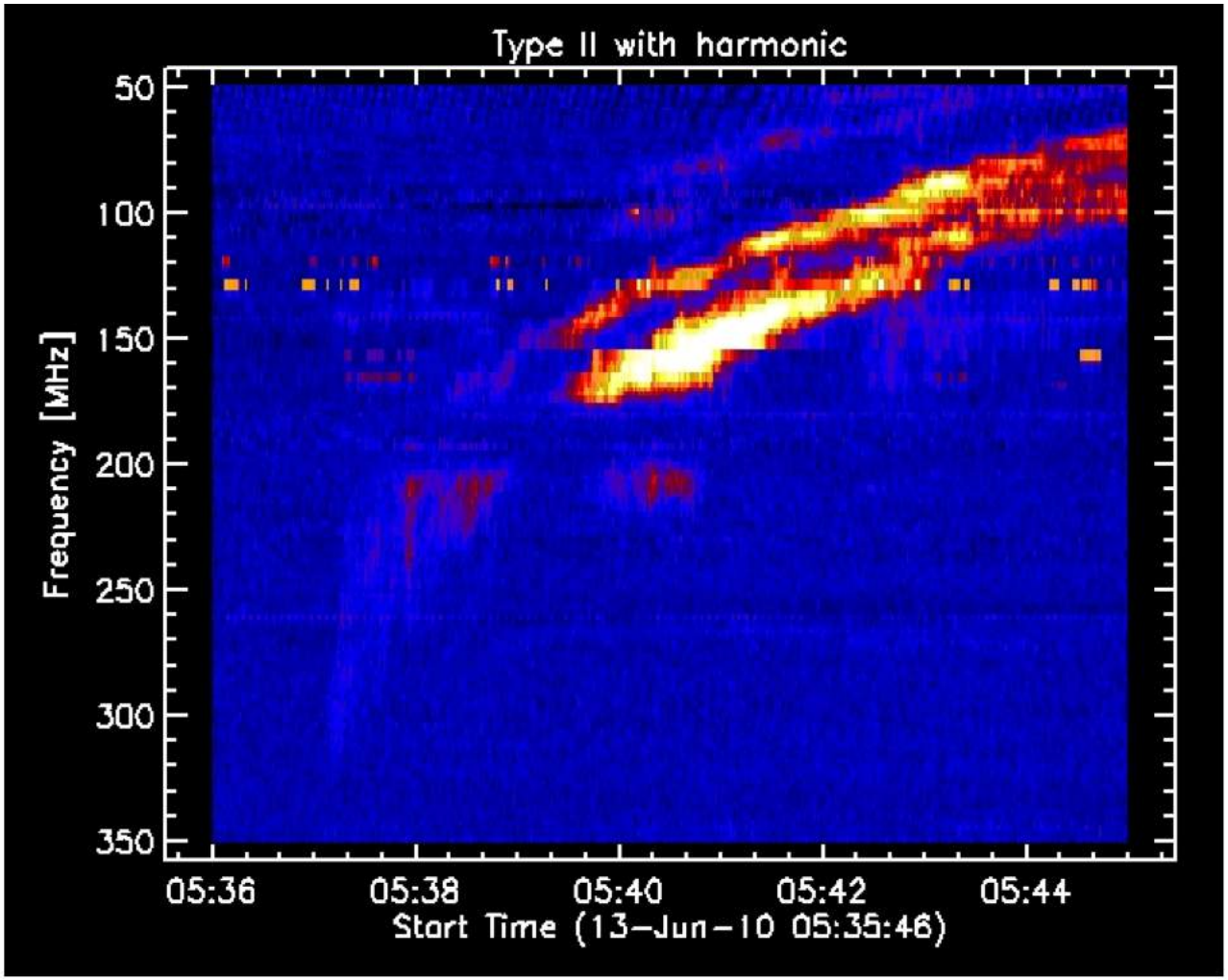


Detection of Coronal mass ejections by Soho



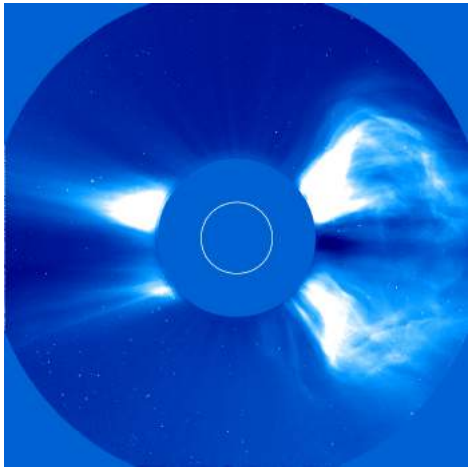


Type II bursts

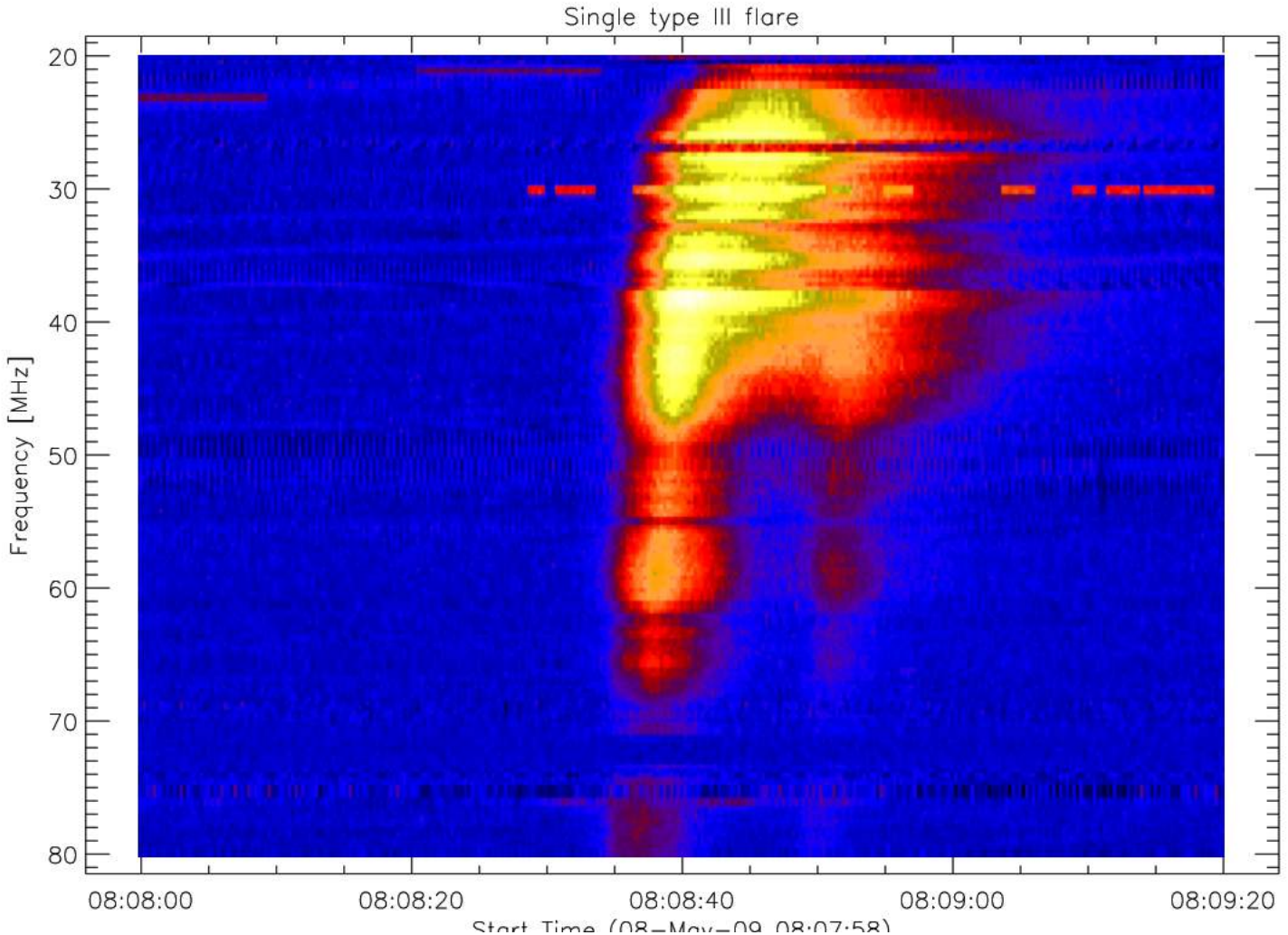


Synchrotron radiation.

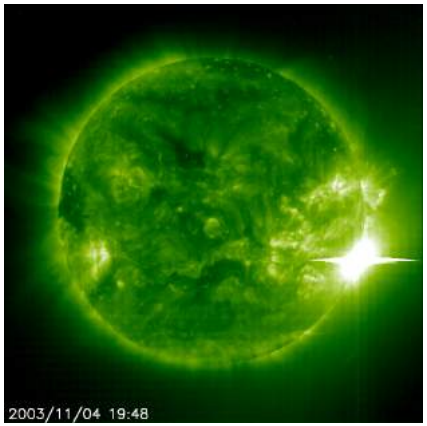
40% of all CMEs are connected to with burst.



Type III burst



Triggered by flare

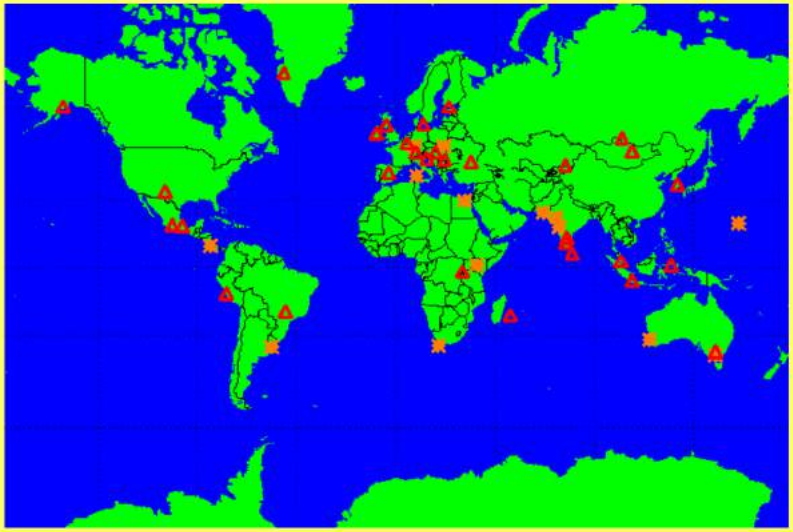


Alternative way

e-callisto.org

e-Callisto

International Network of Solar Radio Spectrometers

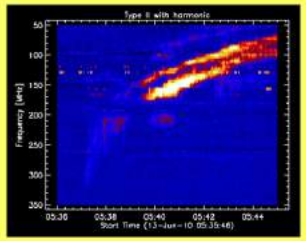


Map of current distribution of Callisto instruments in March 2016

Red triangles: locations provide data, orange star: locations do not provide data yet/anymore

Statistics: more than 120 instruments in more than 67 locations with users from more than 124 countries

e-Callisto logo



Type II burst (Ooty)

E-Callisto antennas

- Many different kinds, measuring from 10 Mhz and up

Latvia

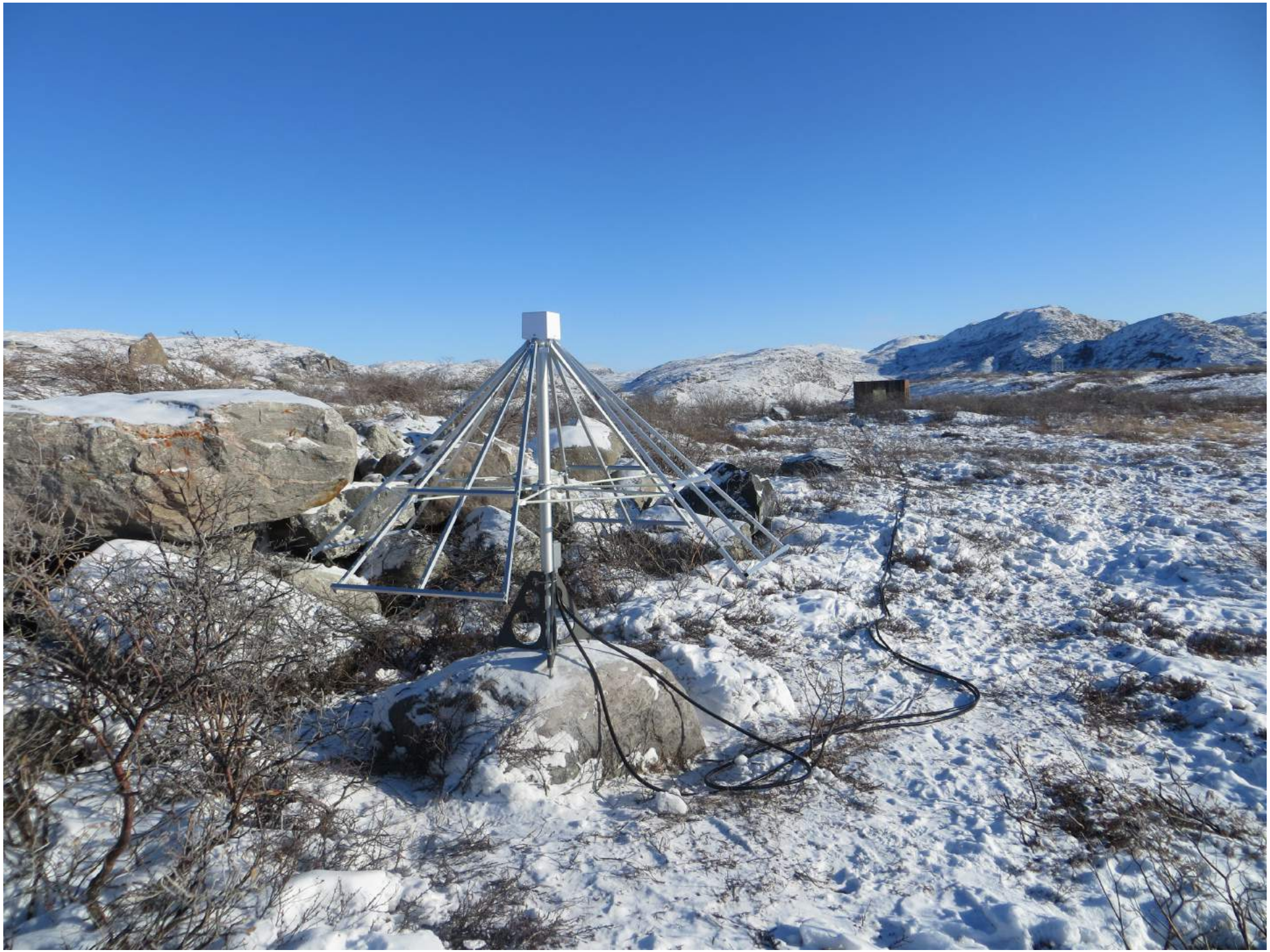
China

Siberia

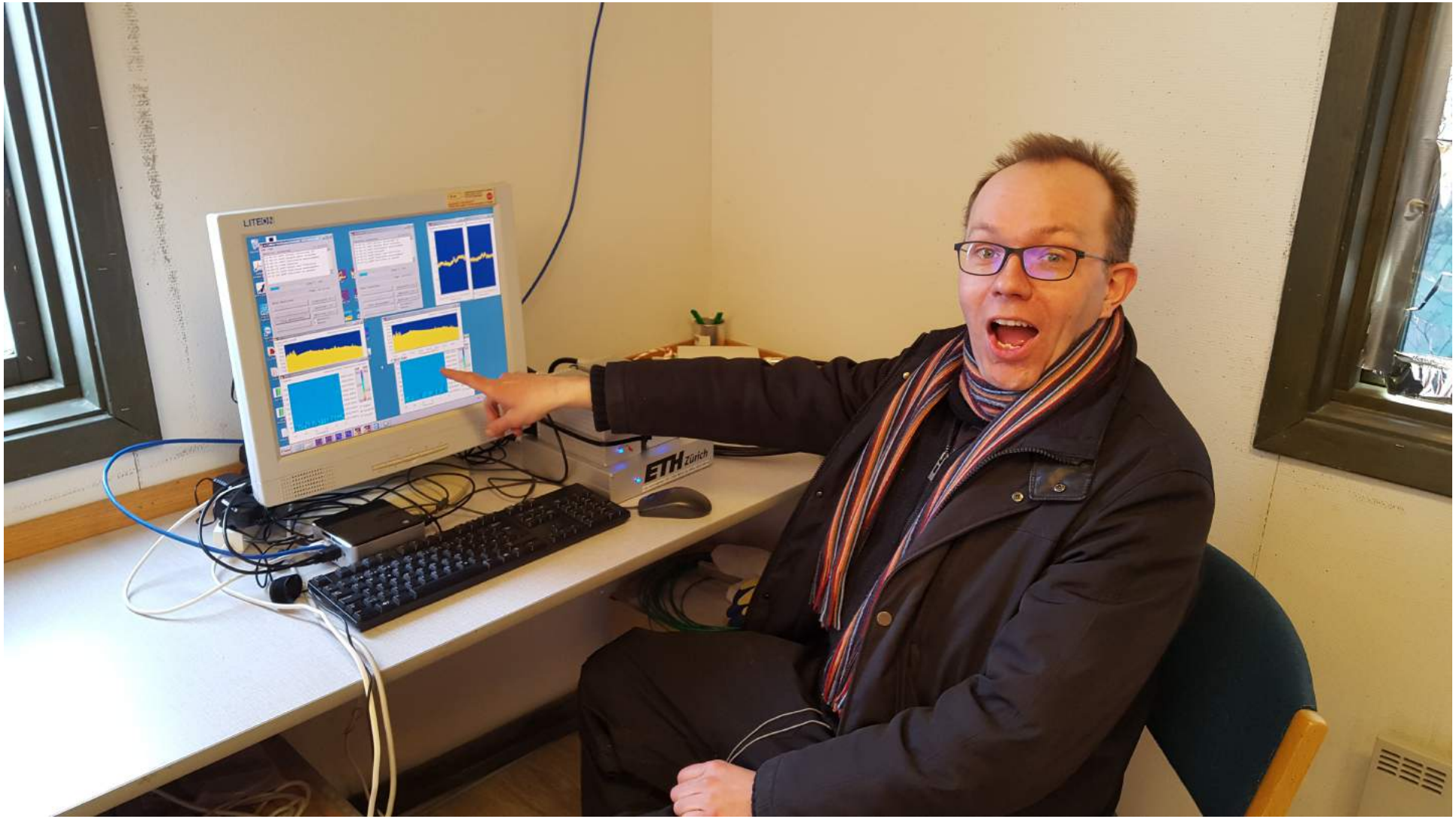
Long Wavelength Array antenna

- 10-100 Mhz

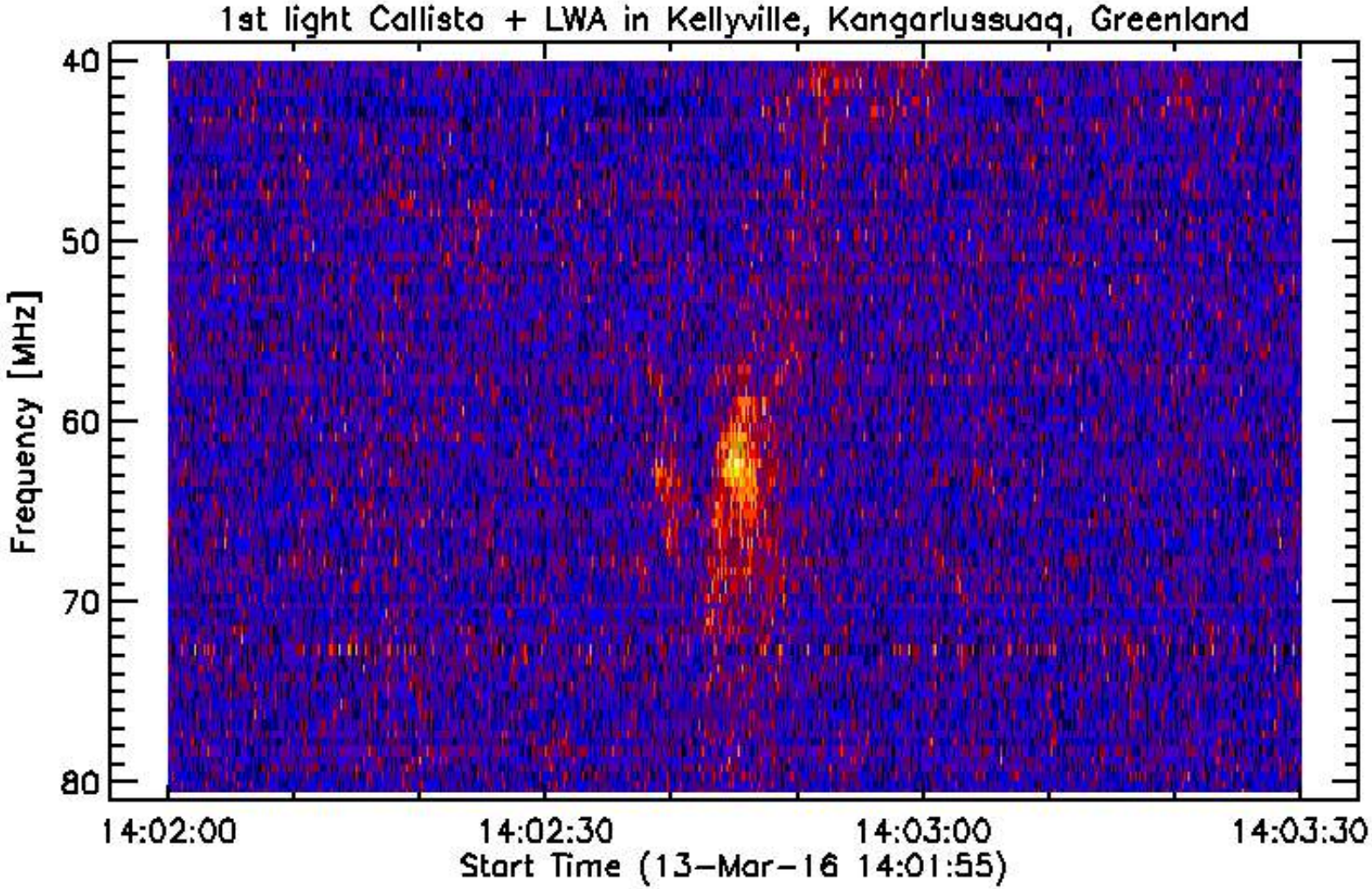
Arctic mounting



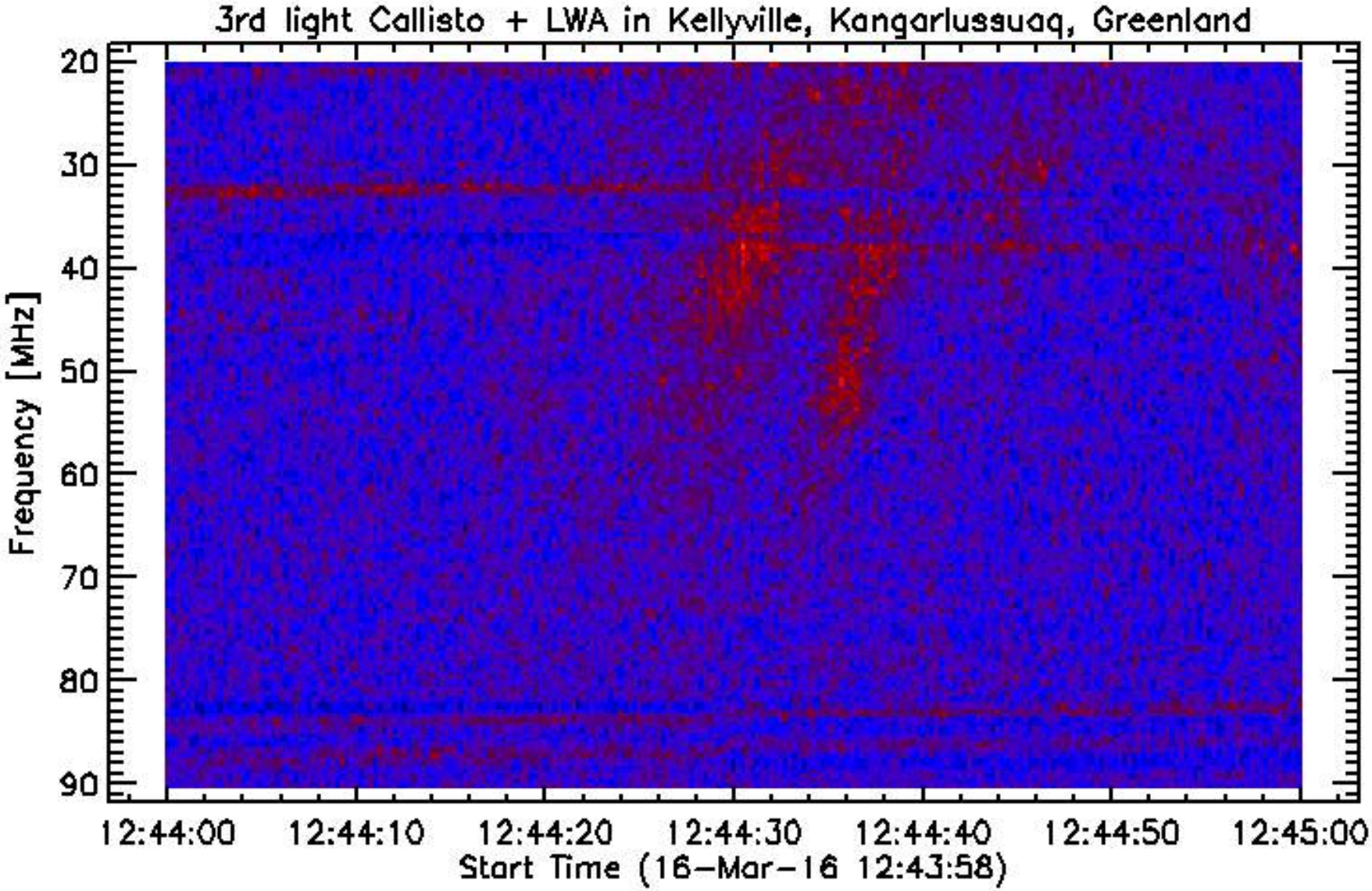
Amazing results



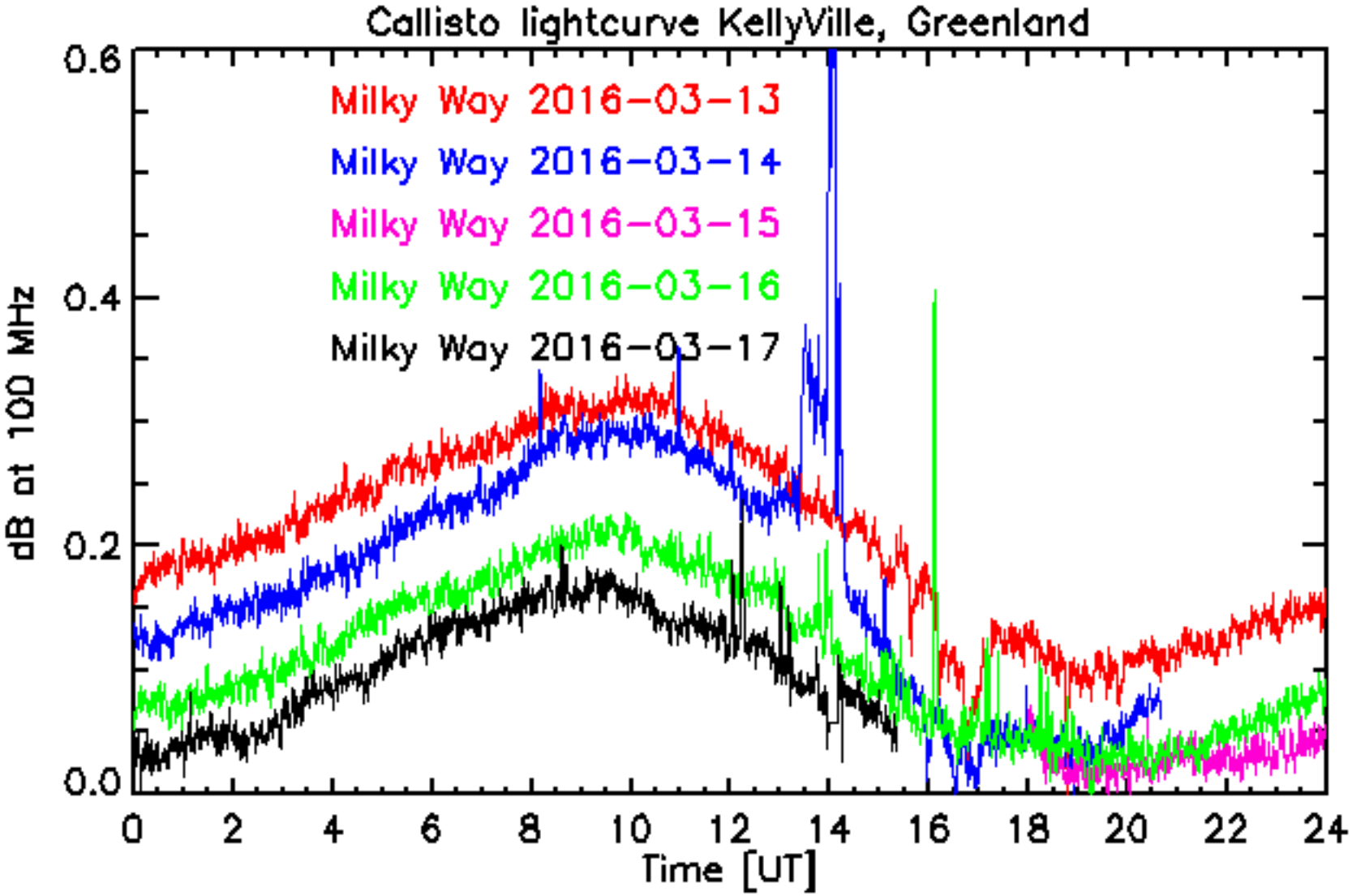
First burst


1st light Callisto + LWA in Kellyville, Kangarlussuaq, Greenland
Frequency [MHz]
40
50
60
70
80
14:02:00
14:02:30
14:03:00
14:03:30
Start Time (13-Mar-16 14:01:55)

First type 2 burst

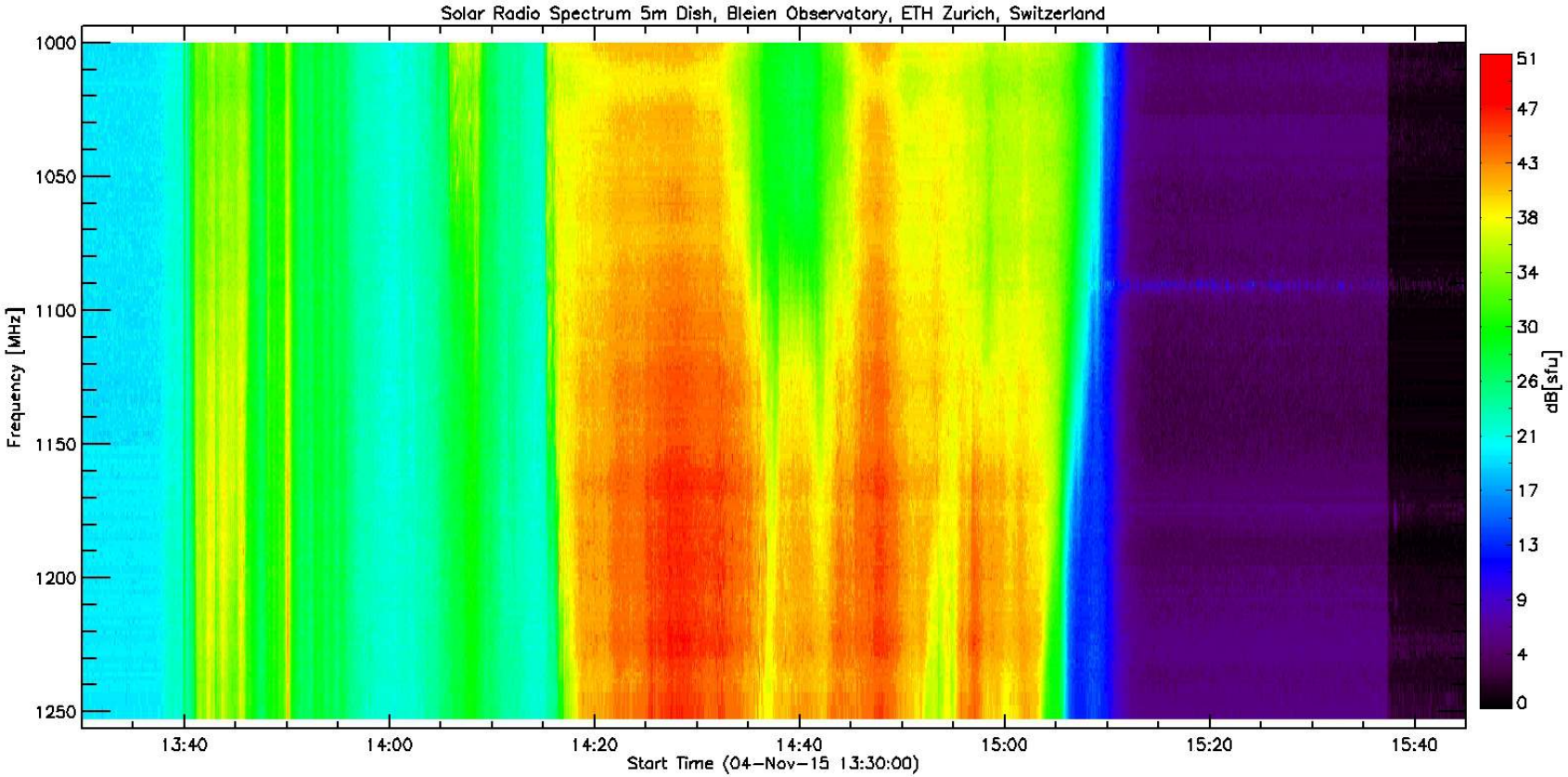


The Milky way?



4th of november 2015

- Two minutes before landing (14.49) in Thule an Air Greenland aircraft had problems with the Instrument Landing System.
- The pilots were unable to ”see” the runaway.
- No malfunctions found on the aircraft afterwards.

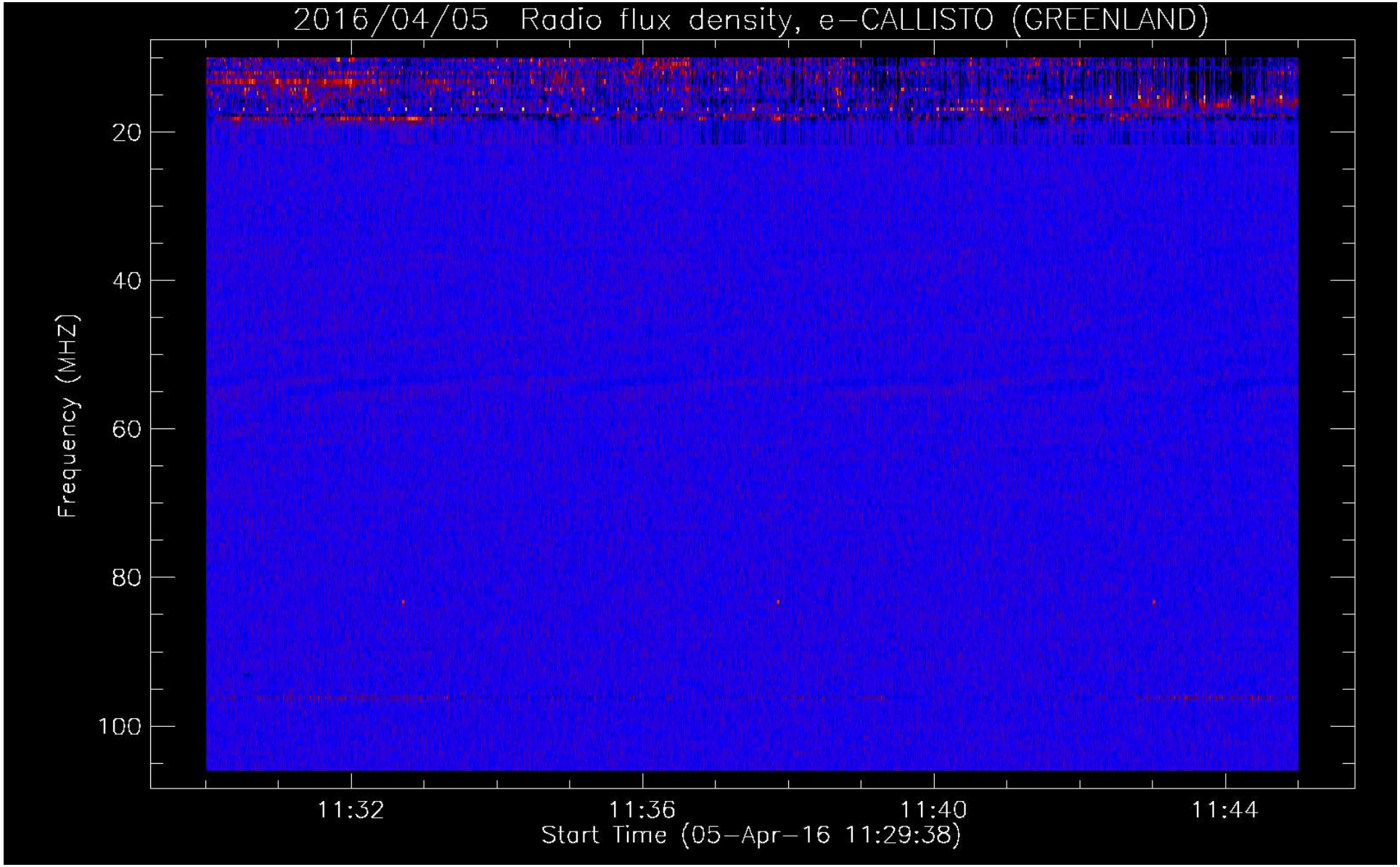


Challenges for the instrument

Wild life

Weather

Breaking News



Conclusions

- The antenna operates in Greenland.
- Kellyville is a great place for radio astronomy.
- Absolute calibration can be made based on the Milky way
- Should be integrated in forecast and assist analyzes of extreme events

Thanks to…

Christian Monstein, ETHZ

HC Ørsted Fonden

73.800 kr

Finn Bo Madsen and Klavs Henriksen, DTU Space

Lots of students