

Citizen science: How Aurora photography can lead to new discoveries

Emma Bruus

Sodankylän Geofysiikan Observatorio

STELLA
CAELUM

UTSJOKI 07102025

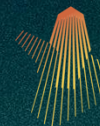
GLOW2.0

Interreg



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Northern Periphery and Arctic



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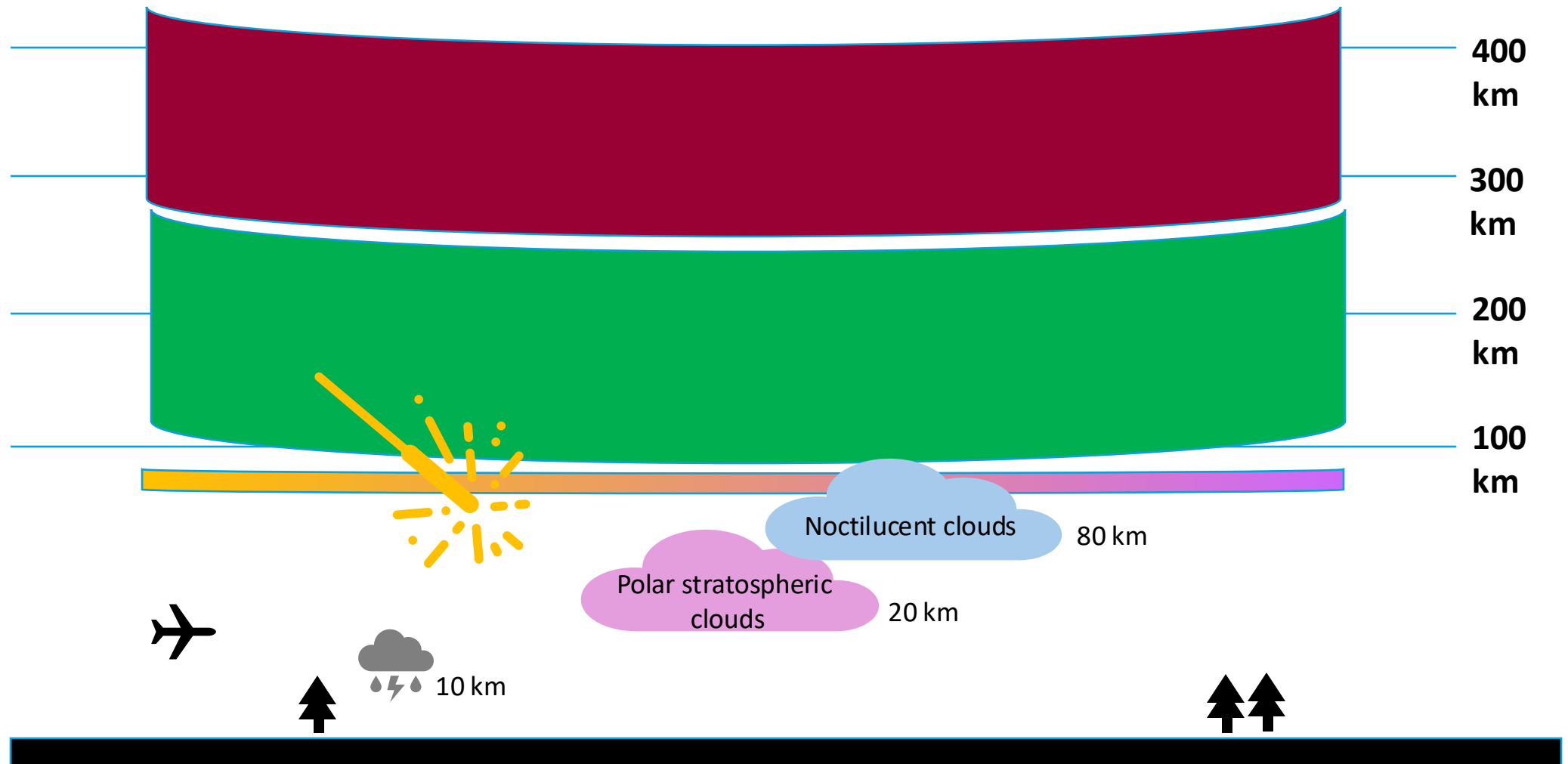
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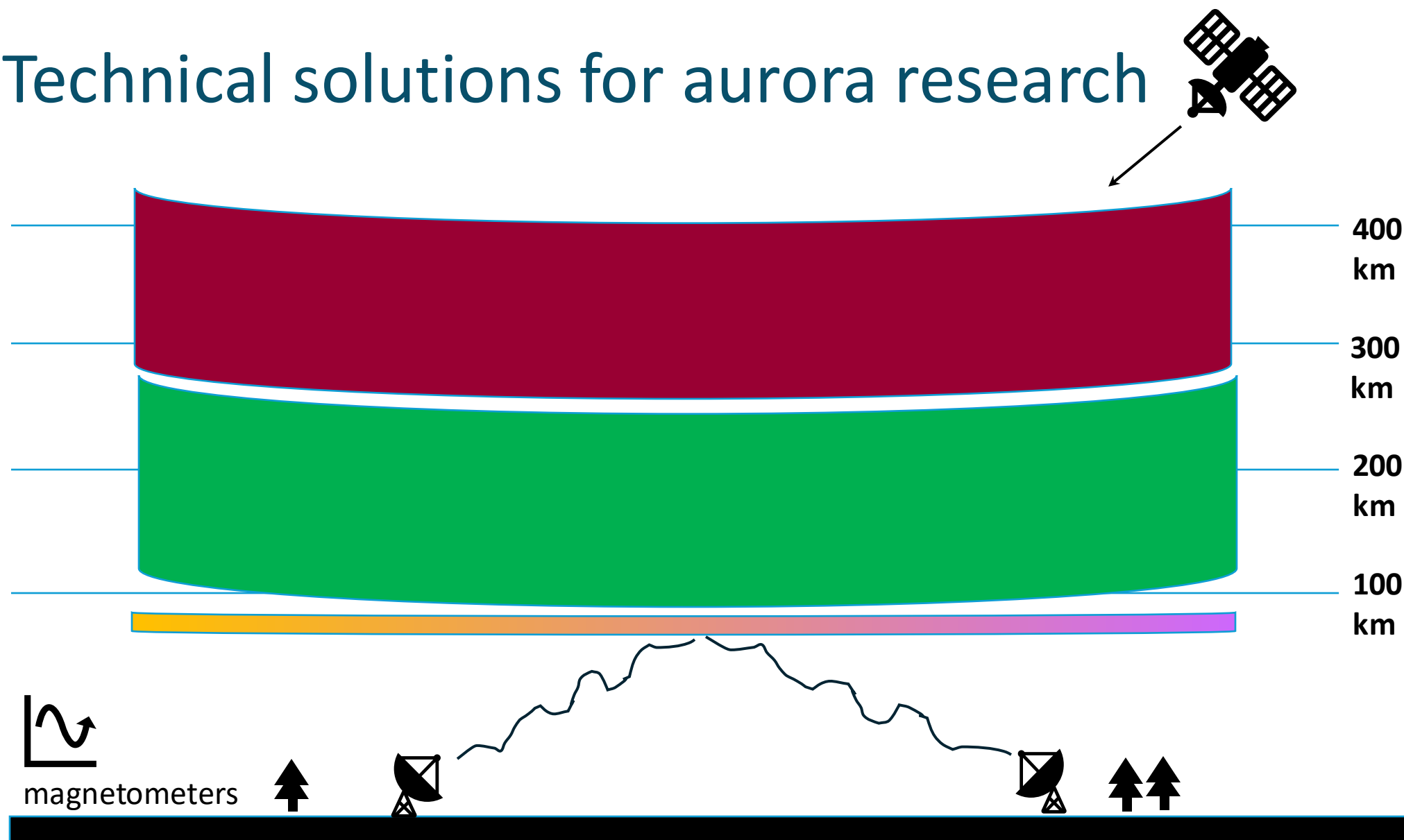
First there was
STEVE

Image: Sirpa Pursiainen

Atmospheric phenomena at high altitudes



Technical solutions for aurora research





Alberta Aurora Chasers

+ Kutsu



SCIENCE ADVANCES | RESEARCH ARTICLE

SPACE SCIENCES

New science in plain sight: Citizen scientists lead to the discovery of optical structure in the upper atmosphere

Elizabeth A. MacDonald,^{1,2*} Eric Donovan,³ Yukitoshi Nishimura,^{4,5} Nathan A. Case,⁶ D. Megan Gillies,³ Bea Gallardo-Lacourt,^{3,5} William E. Archer,^{3†} Emma L. Spanswick,³ Notanee Bourassa,⁷ Martin Connors,^{3,8,9} Matthew Heavner,^{2,10} Brian Jackel,³ Burcu Kosar,^{1,2} David J. Knudsen,³ Chris Ratzlaff,⁷ Ian Schofield⁸

A glowing ribbon of purple light running east-west in the night sky has recently been observed by citizen scientists. This narrow, subauroral, visible structure, distinct from the traditional auroral oval, was largely undocumented in the scientific literature and little was known about its formation. Amateur photo sequences showed colors distinctly different from common types of aurora and occasionally indicated magnetic field-aligned substructures. Observations from the Swarm satellite as it crossed the arc have revealed an unusual level of electron temperature enhancement and density depletion, along with a strong westward ion flow, indicating that a pronounced subauroral ion drift (SAID) is associated with this structure. These early results suggest the arc is an optical manifestation of SAID, presenting new opportunities for investigation of the dynamic SAID signatures from the ground. On the basis of the measured ion properties and original citizen science name, we propose to identify this arc as a Strong Thermal Emission Velocity Enhancement (STEVE).

Oppaat Suositeltu Ihmiset Tapahtumat Media Tiedostot



a jotain...

Kela

Kuva tai video

Kysely

Ratzlaff

his is the last week to get...



CY.TRAVEL



Chris Ratzlaff

5. heinäkuu klo 18:26 · 🌐

July 2023 Aurora Calendar

July Week 2 Update...



RATZLAFF.SUBSTACK.COM

Tietoja

WARNING: Aurora Chasing is known to cause nighttime insomnia and daytime drowsiness resulting from FOMO Syndrome (Fear Of Missing Out). We are n... Näytä lisää

Julkinen

Kuka tahansa voi nähdä, keitä ryhmässä on ja mitä jäsenet julkaisevat.

Näkyvä

Kuka tahansa voi löytää tämän ryhmän.

Alberta

Lisätietoja

Viimeaikainen media

(S)trong (T)hermal (E)mission (V)elocity (E)nhancement

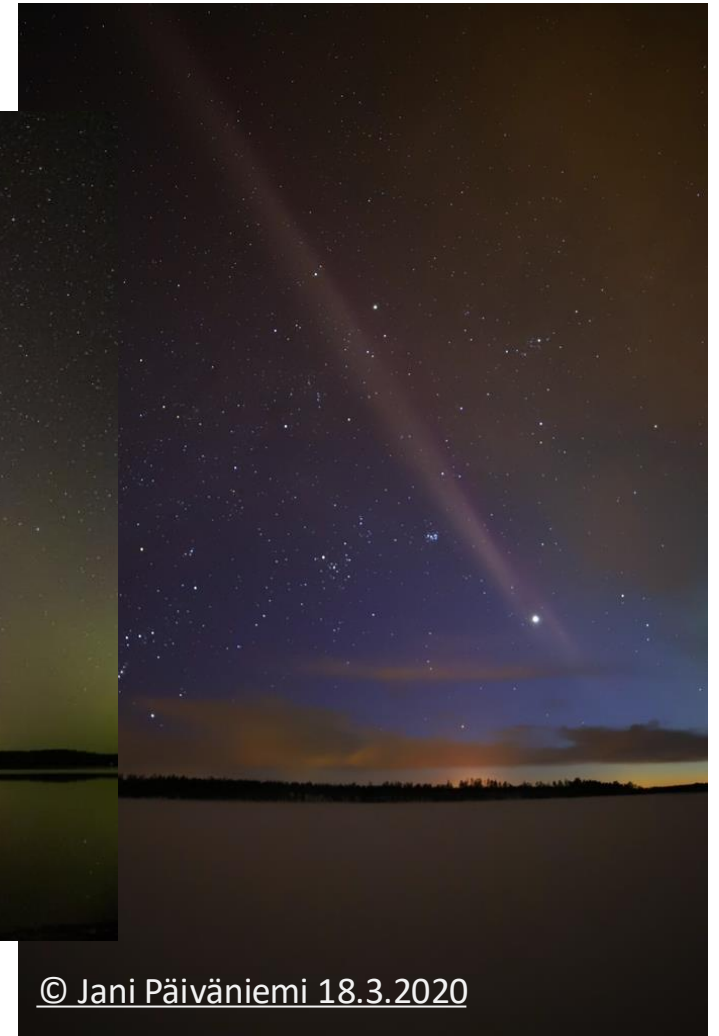
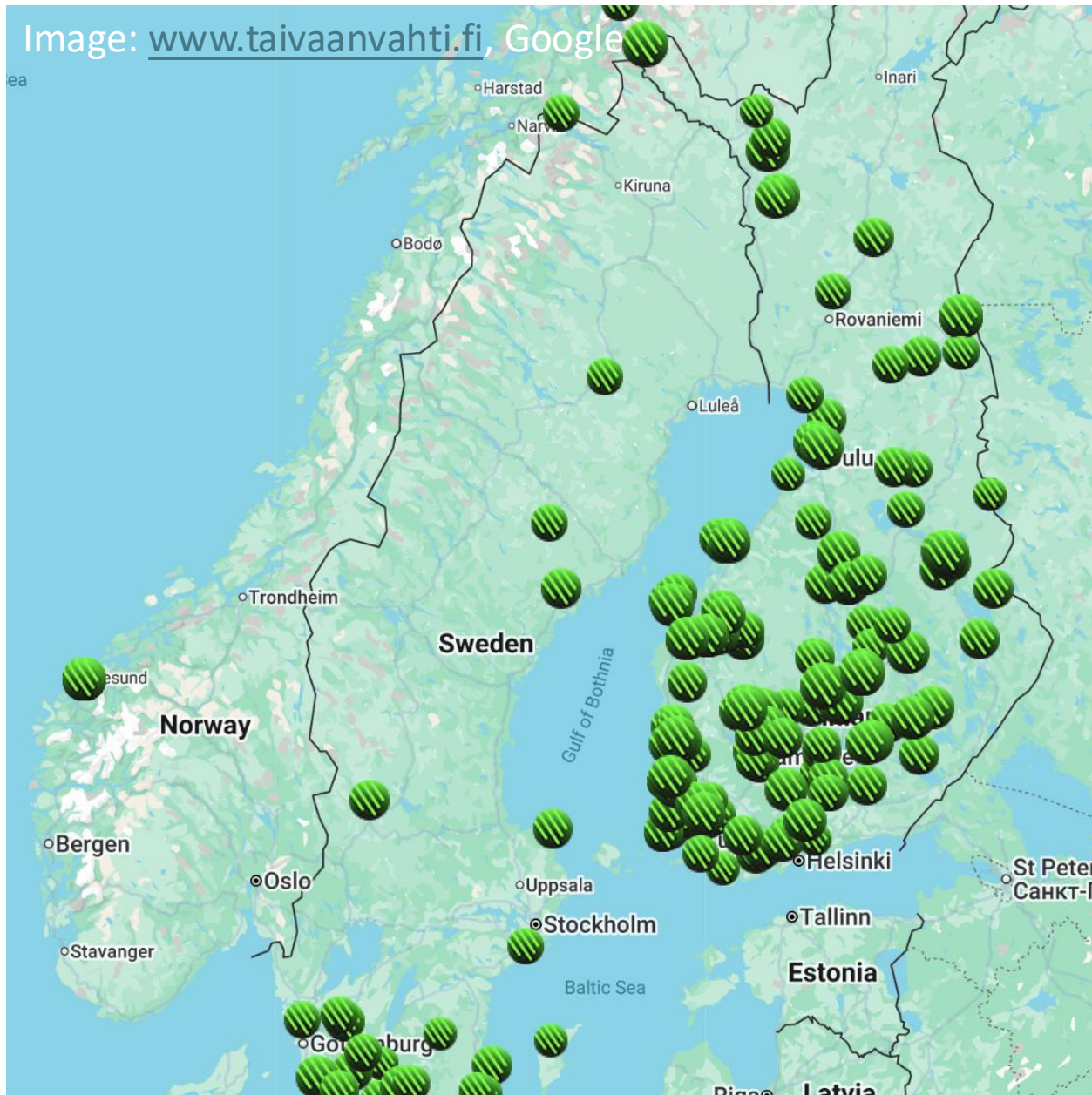
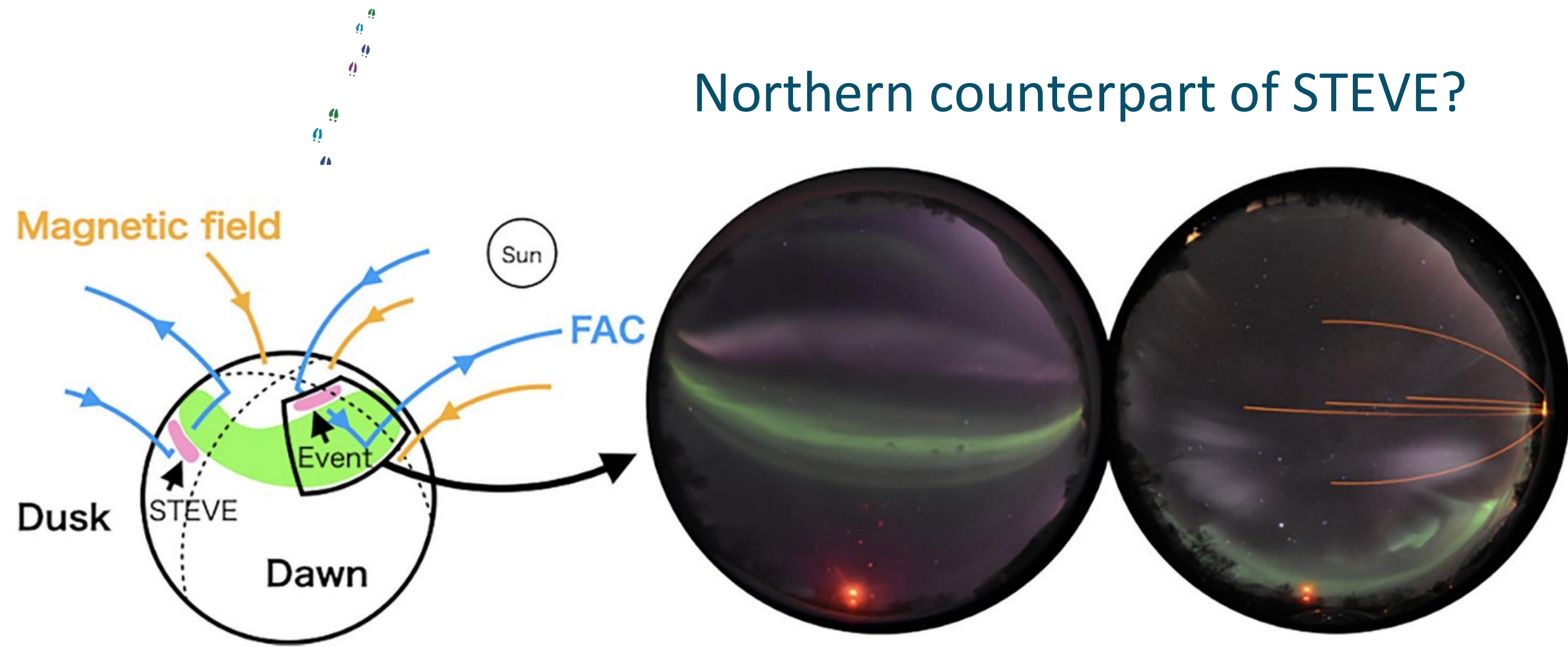


Image: www.taivaanvahti.fi, Google



Where is STEVE?

Northern counterpart of STEVE?



WHO YOU GONNA CALL? AURORA BUSTERS!



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Skywarden

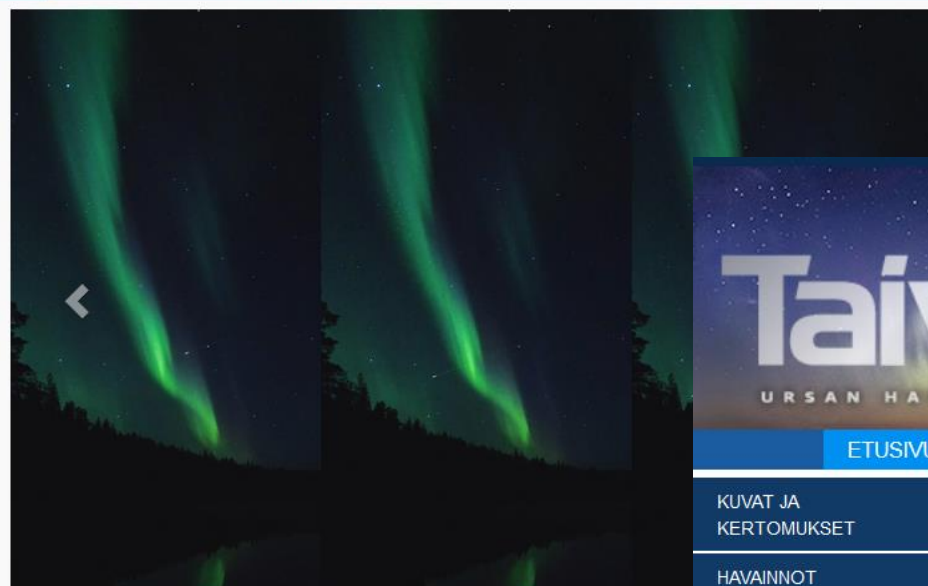
OBSERVATION SERVICE

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Categories

- ☐ Deep space
- ☐ Solar system
- ☐ Eclipses
- ☐ Fireballs
- ☒ Northern lights
- ☐ Rare clouds
- ☐ Storms
- ☐ Halos
- ☐ Other phenomena

Empty selections



Fireball swept across the northern lights

14.10. The drab October cloud cover eased its grip on the night of 12/13, when suitably also northern with camera was [Jari Ylinampa](#), who got lucky with a fireball shooting across the video he took in Ror screenshots, but it is worth checking the actual footage from [Ylinampa's observation](#).

Northern li

Skywarden is an observation system maintained by Ursa Astronomical Association. Available observation categories consist of different astronomical and atmospheric phenomena. You are welcome to participate.

Taivaanvahti

URSAN HAVAINTOJÄRJESTELMÄ

[ETUSIVU](#)[HAVAINNOT](#)[JÄTÄ HAVAINTO](#)[ILMOITUKSET](#)[FAQ](#)[UUTISET](#)[TILASTOHAKU](#)[MEDIALLE](#)[KUVAT JA
KERTOMUKSET](#)[HAVAINNOT
KUVINA](#)[HAVAINNOT
LISTANA](#)[HAVAINNOT
KARTALLA](#)[HAVAINTOHAKU](#)[Uusimmat havainnot](#)

Sysmä, Rauhallinen revontulikaari II
8.9.2016 klo 03.15

Tampere, Aktiivinen revontulivyö
III



2-4.9. kohonnut mahdollisuus revontuliille

Taivaanvahti on Ursan havaintojärjestelmä, jonka tietokantaan kerätään tähtitieteellisten ja ilmakehän ilmiöiden havaintoja. Voit osallistua ilmoittamalla havaintosi, vaikka et olisi Suomen tähtitieteellisten yhdistysten jäsen. Voit valita vasemmalta selattavaksi esimerkiksi viimeksi julkaistut [kuvan ja havaintokertomuksen](#) sisältävät havainnot. Järjestelmän käyttöä koskeviin kysymyksiin löytyy vastauksia [usein kysytyt](#) -sivulta.

[JÄTÄ HAVAINTO](#)

Matti Helin 7.10.2015



Dunes

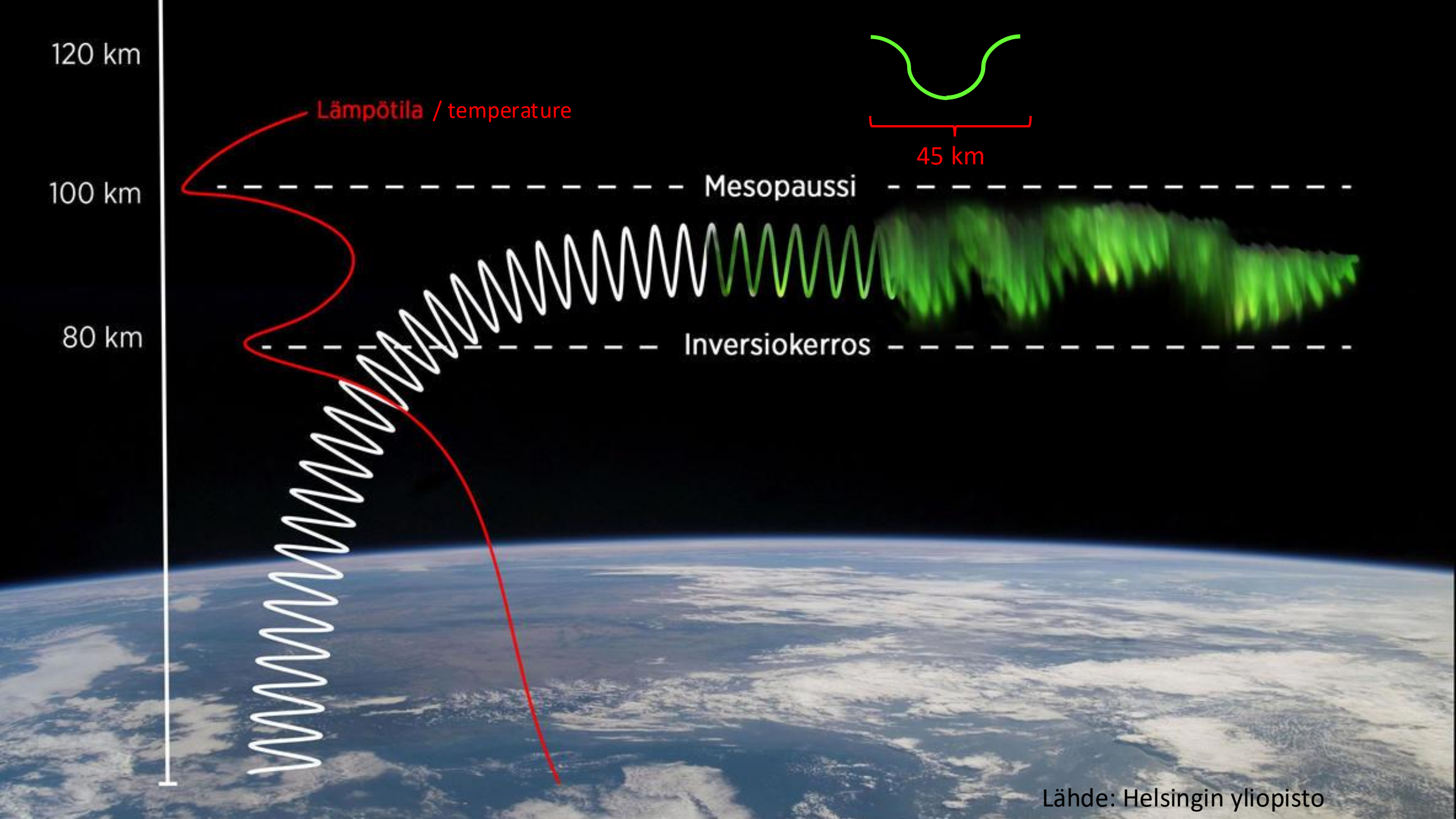
How do I identify the dunes?

- (x) Wavy structures
- (x) On diffuse aurora surface

Clouds can sometimes produce similar sceneries -> Take timelapses

Image Rami Valonen, 7.10.2018

© ramivalonen.net



Kuva: Sophie Cordon, Huippuvuoret



Fragmentit (FAE)



Kuva: Marjan Sijkers

A person in dark clothing stands on a large, mossy rock in a snowy, forested landscape at night. The sky is filled with stars and a faint aurora borealis. The scene is illuminated by a soft light source, possibly the moon or a distant star, creating a silhouette effect on the person and the surrounding trees.

Thank you!

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