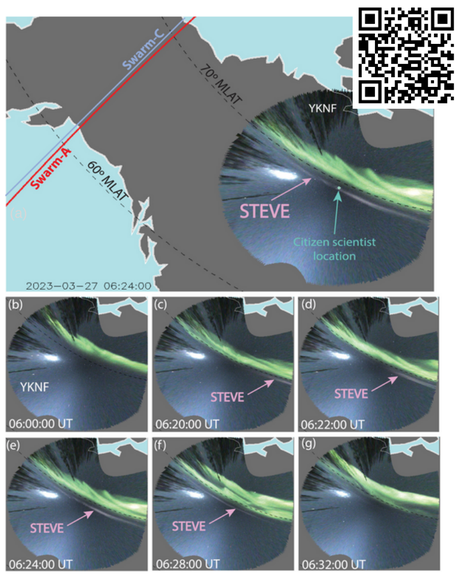
# Skywarden, AurorEye, GHOSTs… Citizen science brings the dawn of a new age for auroral research

## Leveraging citizen science for auroral research: ARCTICS and beyond

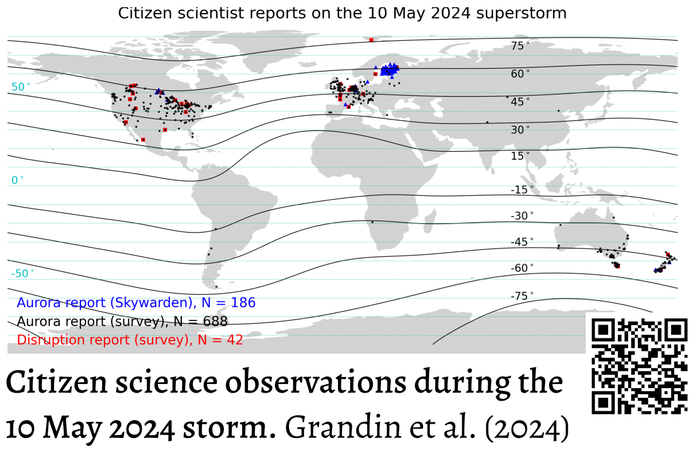
**Maxime Grandin**[1], Bea Gallardo-Lacourt[2,3], and the ARCTICS Working Group collaborators[4]

**Background:** The "Auroral Research Coordination: Towards Internationalised Citizen Science" (ARCTICS) Working Group, sponsored by ISSI-Bern (2023–2025), aimed to promote co-created citizen science applied to the study of nightsky optical emissions (STEVE, fragmented aurora-like emissions, dune aurora, continuum emissions…). Beyond the project, the collaboration continues, with more ideas and initiatives than ever. We advertise some of the results and future plans.

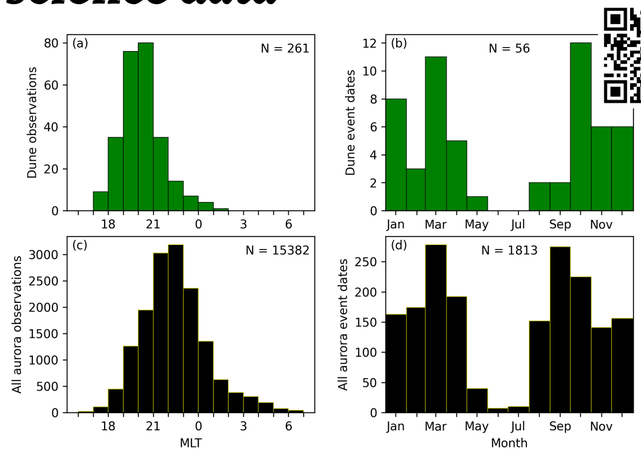
## Numerous studies of optical emissions using citizen science data




Unexpected observations of STEVE at high latitude during quiet geomagnetic conditions. Gallardo-Lacourt et al. (2024)

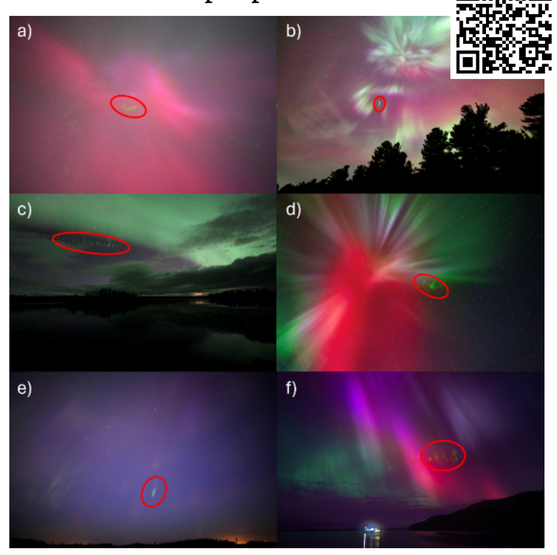



Citizen science observations during the 10 May 2024 storm. Grandin et al. (2024)

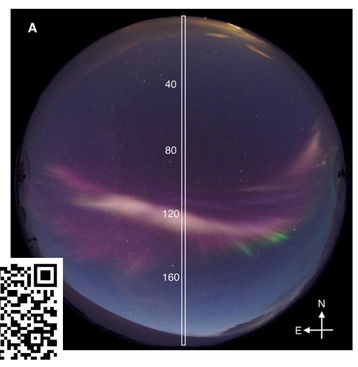


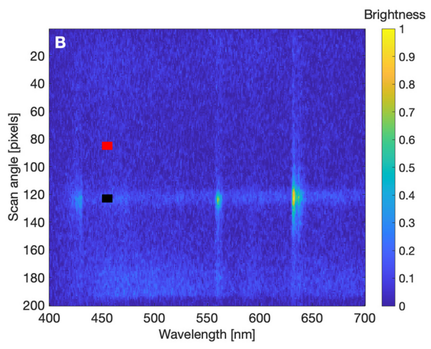

Survey of dune aurora observations. Grandin et al. (2026)

Global citizen science observations of fragmented aurora-like emissions. Mielke et al. (preprint)

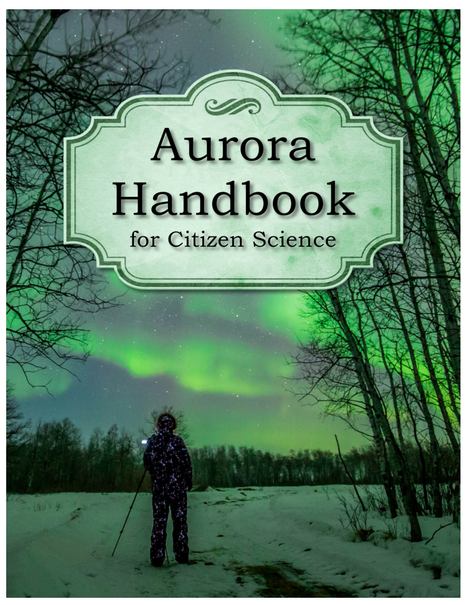



Continuum emission (aka GHOST: geomagnetic high-bandwidth optical spectra from the thermosphere) in dayside aurora. Partamies et al. (2025)



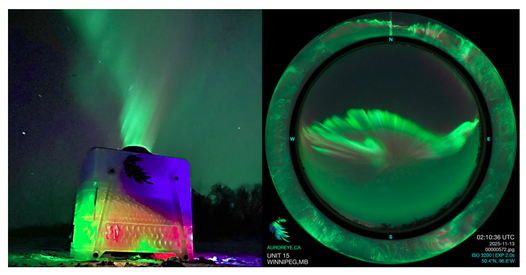




## Shaping the future of auroral science



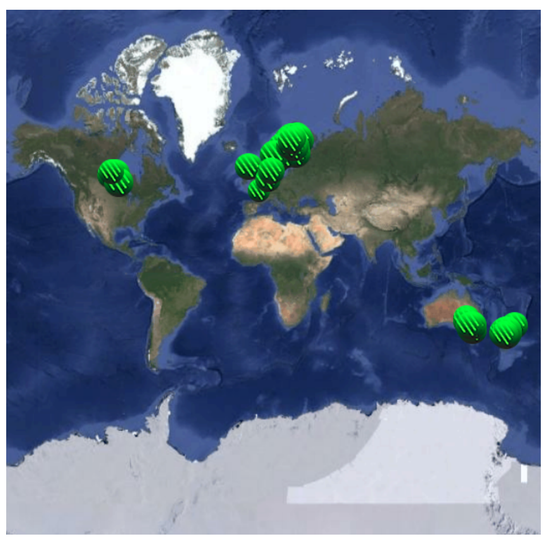

ARCTICS Aurora Field Guide & Handbook for Citizen Science. Herlingshaw et al. (2024)

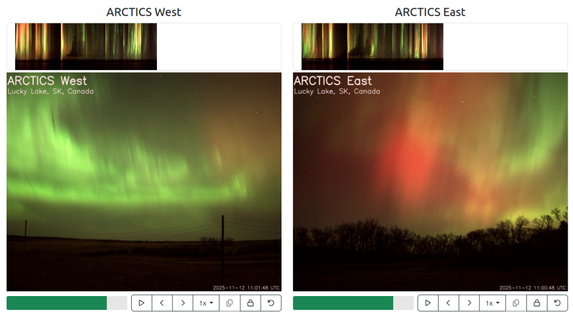


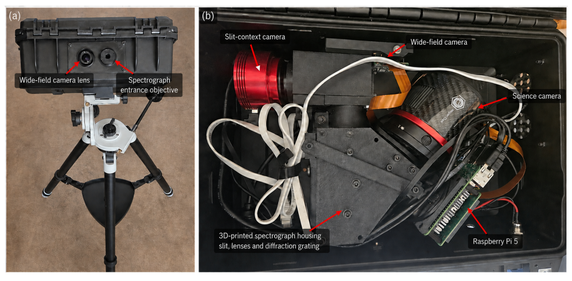
AurorEye: a portable all-sky camera for citizen scientists. Jeremy Kuzub, Canada

Skywarden observation database. Ursa, Finland






ARCTICS-SMILE: When scientific imagers mimic citizen science cameras. University of Calgary, Canada




Review article (Grandin et al., 2025, *Surveys in Geophysics*)

NORVIS: a low-cost, portable spectrometer. BIRA–IASB, Belgium

### Key outputs of ARCTICS

- 10 peer-reviewed articles (+ 3 submitted preprints)
- Aurora Field Guide & Handbook for Citizen Science
- New portable optical instruments for citizen scientists
- Citizen-science-inspired imagers (ARCTICS-SMILE)
- Expansion of the network of Skywarden contributors

[1]Finnish Meteorological Institute, Finland; [2]NASA–GSFC, USA; [3]The Catholic University of America, USA; [4]sponsored by ISSI-Bern, Switzerland.

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