

Manual macrophotography of precipitation particles

Julie Thériault and Mathieu Lachapelle

Université du Québec à Montréal (UQAM)



Canada Research Chair in
Extreme Winter Weather Events

Virtual Wintre-Mix Workshop, 13 décembre 2021

Motivation

Goal:

To document the type and shape of precipitation particles during the cold season

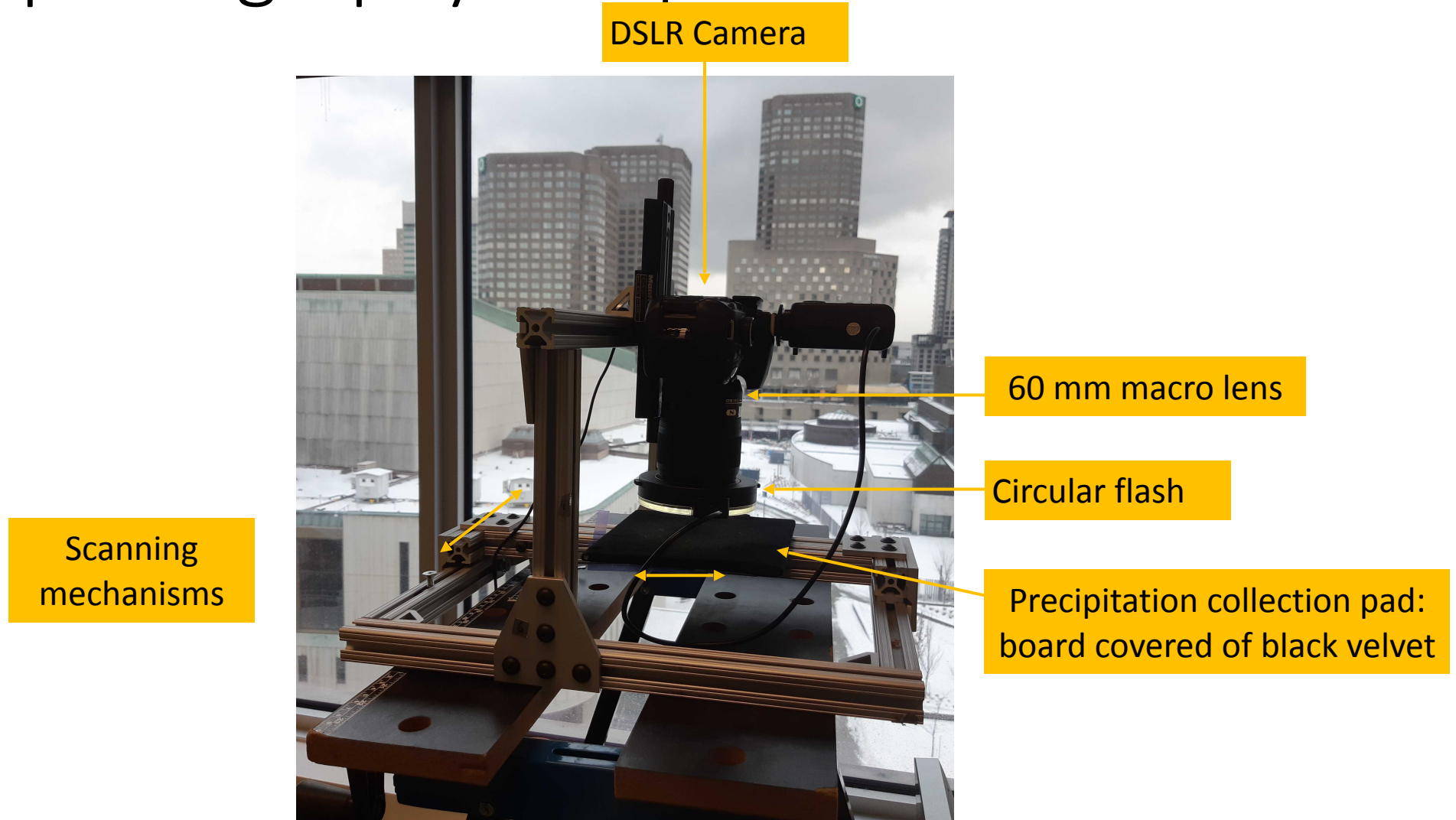
Background:

- Used the same setup as in Gibson and Stewart (2007)
- Collect and photograph systematically precipitation particles
- Analyse the photos manually and automatically

Manual precipitation observations

- Record manually the type of precipitation
- Take picture of precipitation particles in a systematic manner
- Collect precipitation type as often as possible to capture transitions

Macrophotography setup



Macrophotography setup in the field

Downtown Montreal, Quebec, Canada

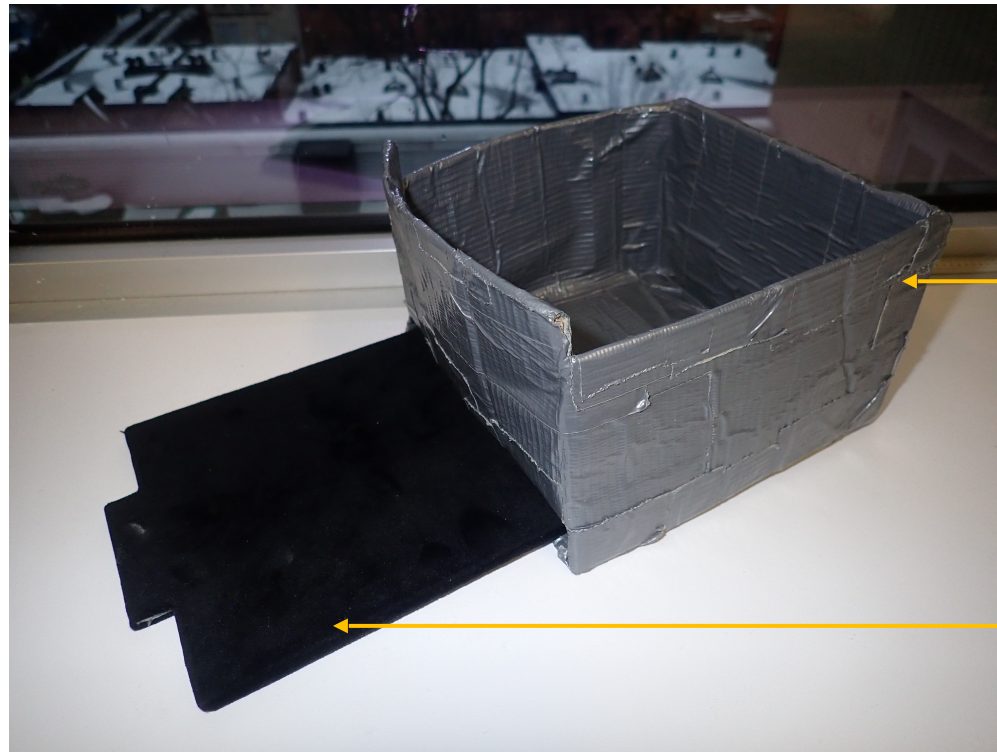


Canadian Rockies, Alberta, Canada



Collection of precipitation particles

- Observation frequency:
 - 10 minutes
- Collection of hydrometeors:
 - Particles should not touch each other
 - Exposition time depends on the precipitation rate
 - Add the box during windy conditions
- Photograph the collection pad:
 - Insertion of the pad below the camera
 - Use the flash
 - Take 9 pictures systematically



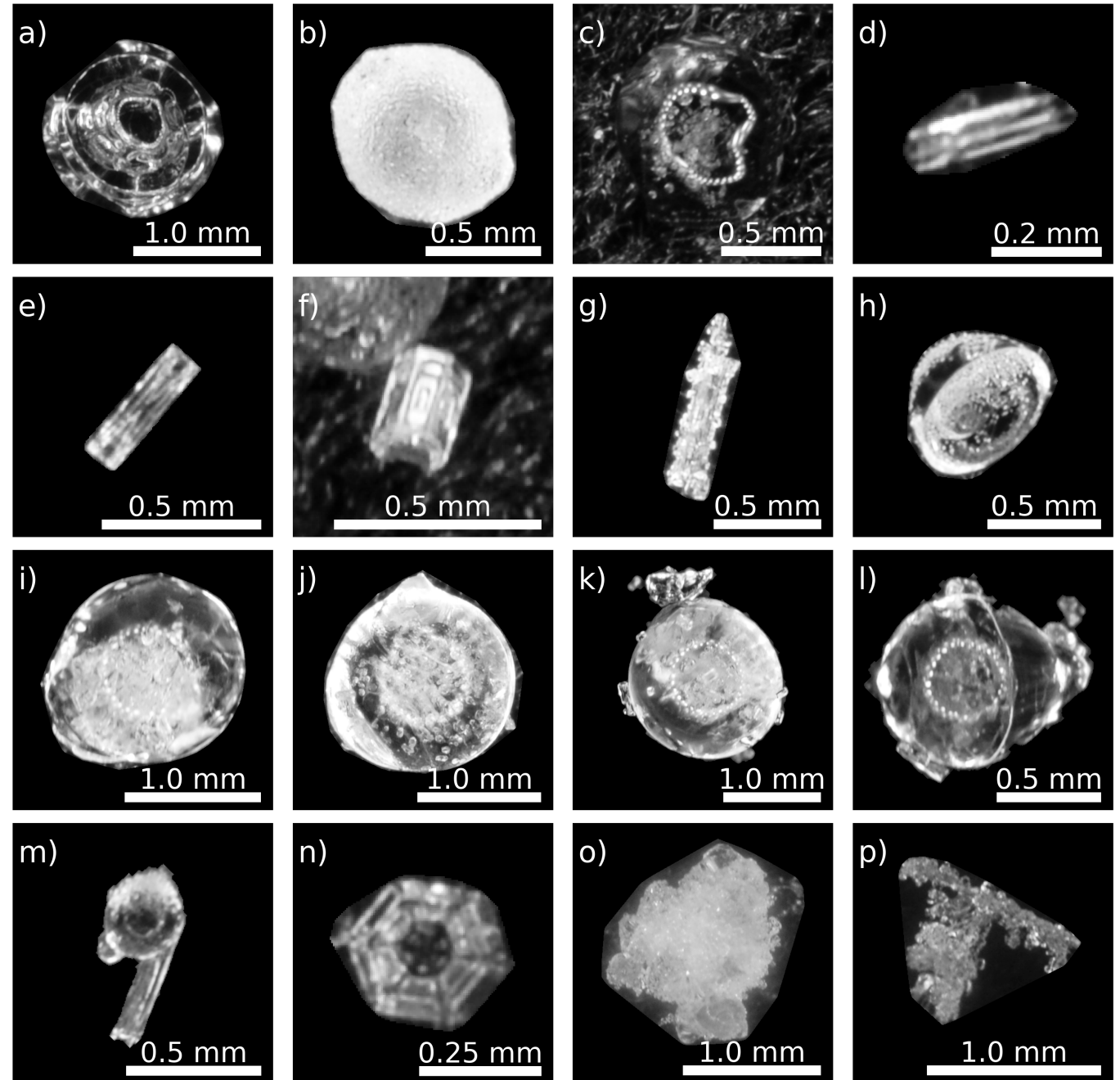
Small box to prevent ice pellets to bounce off the collection pad

Precipitation collection pad

★ Make sure the collection pad remains relatively cold. ★

Some examples

Ice pellets photographed



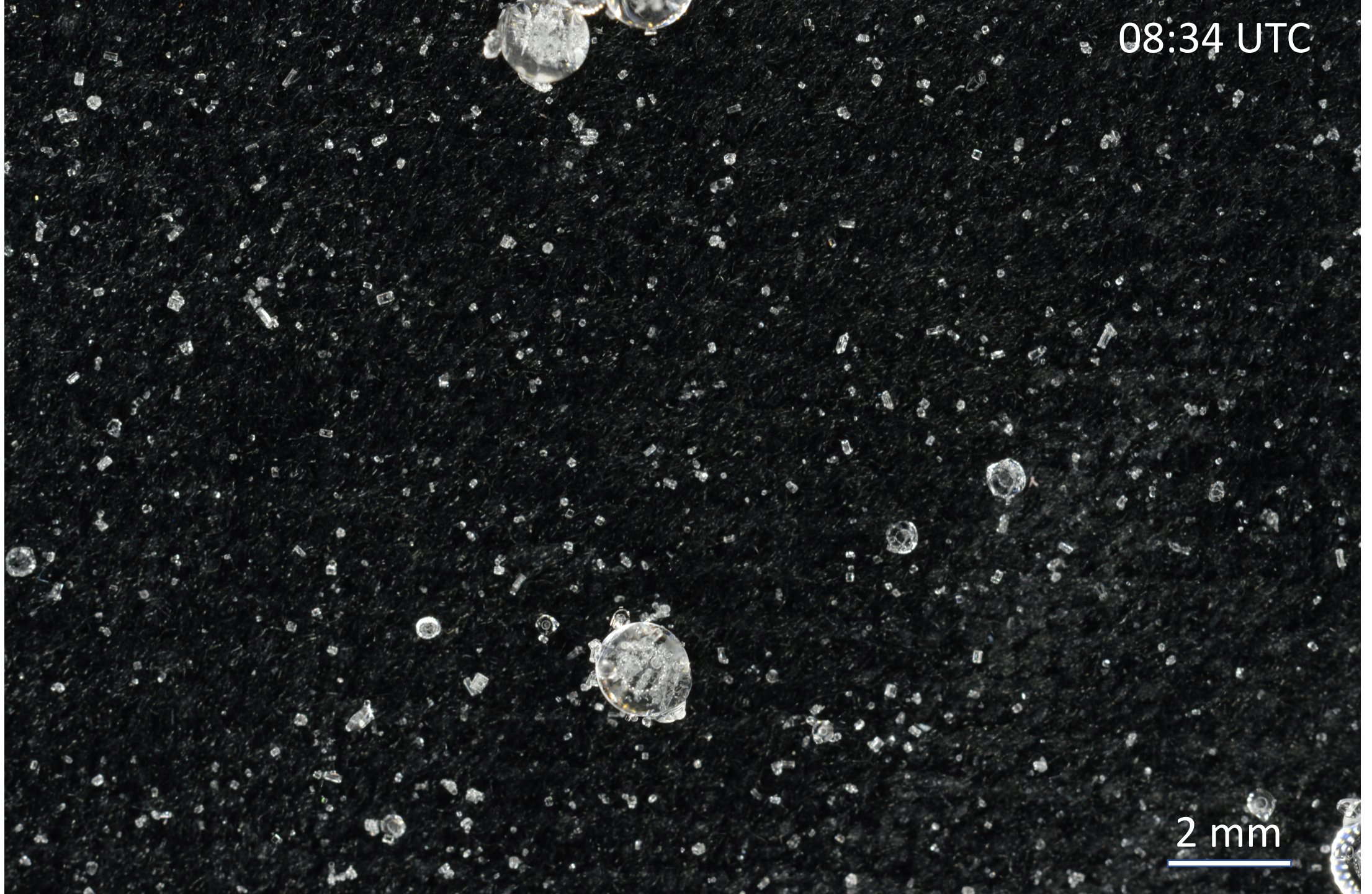


1 mm

This image shows a microscopic view of numerous biological specimens, likely microorganisms or cells, against a black background. The specimens vary in size and shape, with some appearing as small, round, translucent spheres and others as more complex, elongated structures. A yellow double-headed vertical arrow in the bottom right corner indicates a scale of 1 mm.

08:34 UTC

2 mm



Summary

- Manual photography allows to observe particles that are difficult to detect using automatic instruments
- Precipitation types can change quickly during near-0°C storms
- Precipitation types often occur in combination, which will be possible to analyse with the manual observations and photos.

Thank you!
Questions?