

# Svalbard Integrated Arctic Earth Observing System

**A cooperative  
international research infrastructure**

- Building an observing system  
to answer big questions of Earth System Science



24. februar 2021

Shridhar Jawak, Svalbard



# An anchor point to a drifting world!

## SIOS webinar series

### Why?

Cancelled field campaigns

Cancelled conferences

To provide a social experience to the Svalbard research community in challenging times

2 Webinars,

1 Online Conference

1 Online training Course



# An anchor point to a drifting world!

**27th March 2020**

Shridhar Jawak (SIOS Remote Sensing Officer)

**Welcome and introduction to the webinar**

Agnar Sivertsen (NORCE):

**Airborne remote sensing in Svalbard (with emphasis on recently launched SIOS's opportunity)**

Ann Mari Fjæraa (NILU):

**New Pandora Spectrometer instrument and opportunities for atmospheric Cal/Val in Arctic areas**

Veijo Pohjola (Uppsala University):

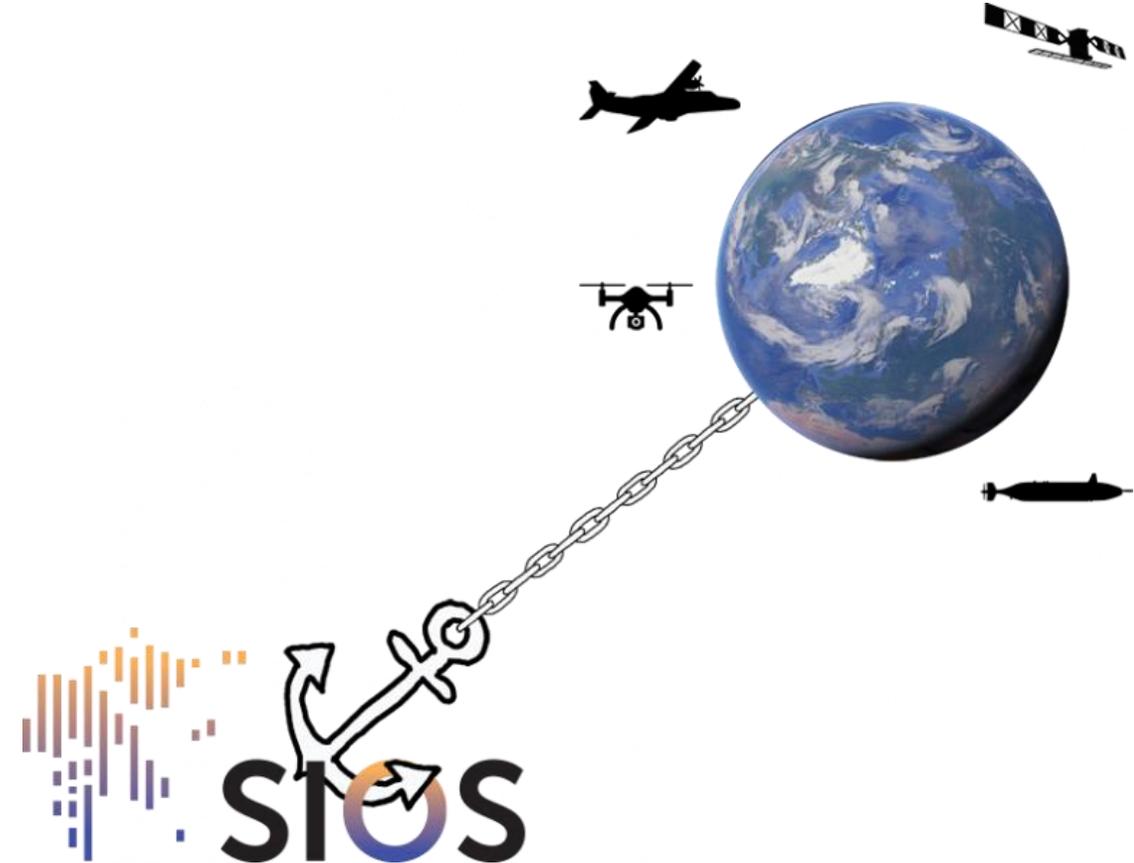
**Glaciological & microbiological observations of Lomonosovfonna perennial firn aquifer**

Roberto Salzano (CNR):

**The support of terrestrial photography on cryospheric studies in Svalbard islands**

Jack Kohler (NPI):

**Svalbard glacier mass balance from annual Arctic DEMs 2013-2017**



# An anchor point to a drifting world!

## Panel discussion: “Damage mitigation for the Svalbard scientific community”

**Moderator:** Veijo Pohjola, Co-Chair, RSWG

**Panel:** Heikki Lihavainen, Jack Kohler, Agnar Sivertsen, Roberto Salzano, Ann Mari Fjæraa

The panel discussion on what kind of data and field activities are being affected due to current situation. The remote sensing community will respond on how they can help in this situation.

- What are possible effects of the current situation on Svalbard research in general?
- How would EO/RS based studies get affected?
- How to control the damage because of cancelled field campaigns and data loss by using remote sensing observations?
- Can we fill all the data gaps in observations using remote sensing?
- What can be done to fill the gap of missing ground truthing this year?



# An anchor point to a drifting world!

24th April 2020

Shridhar Jawak (SIOS Remote Sensing Officer)

**Welcome, updates from SIOS-KC and introduction to the webinar**

Richard Ashley Morris (NPI):

**Remote sensing of Svalbard mass balance, 2011-2017**

Hannah Ming Siu Vickers (NORCE):

**A 20-Year MODIS-Based Snow Cover Dataset for Svalbard and Its Link to Phenological Timing and Sea Ice Variability**

Lukasz Stachnik (University of Wroclaw):

**Carbon cycle in a perspective of glacier recession - marine or terrestrial control?**



# An anchor point to a drifting world!

## Panel discussion: "SIOS data management"

**Moderator:** Dariusz Ignatiuk (SIOS Science Integration & Data Officer)

**Panel:** Øystein Godøy, Stein Tronstad, Angelo Viola

### Discussion topics:

- What benefits can scientists have from open data policy?
- How to motivate the scientists to share data?
- What are the concerns and obstacles to make data free and open?
- How to better link researchers with data managers?
- How does SDMS contribute to the open science and data sharing?



# SIOS Online Conference

Earth Observation, Remote Sensing and Geoinformation applications in Svalbard

## Quick facts

- More than 350 registered participants
- 37 submitted abstracts
- More than 50 talks
- Presenters from  $\approx$  24 institutions in 12 countries

## Keynotes talks

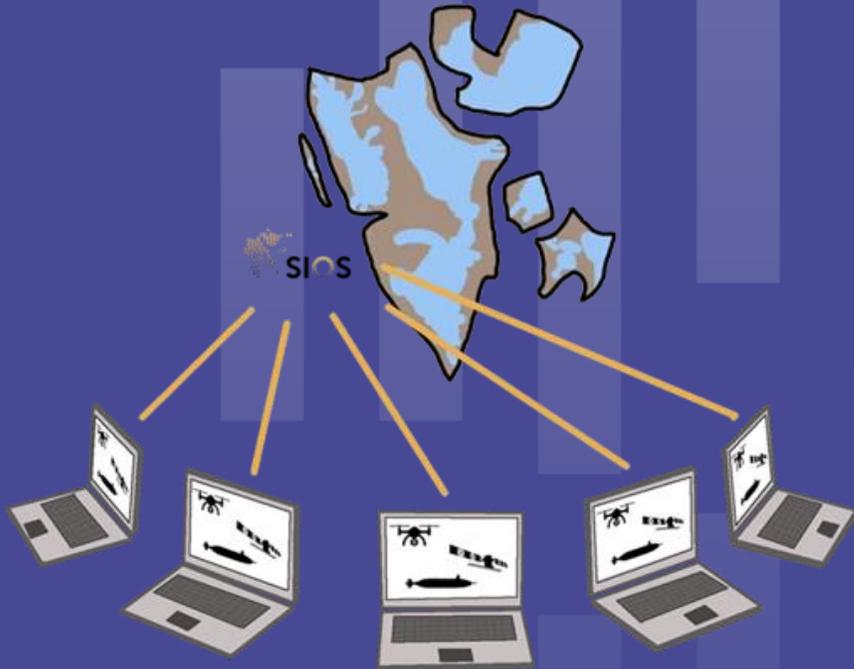
European Space Agency (ESA)  
Arctic Amplification project  
Finnish Meteorological Institute

## Invited talks

MOSAIC's remote sensing activities,  
NORCE,  
Norwegian Space Agency (NoSA)

## Special SIOS sessions

- ACCESS
- SESS
- recently launched airborne campaigns in Svalbard



# SIOS Terrestrial Remote Sensing Training Course

Combining ground based observations with data from drones and satellites

31 August – 04 September 2020

Vegetation map of Adventdalen. Credit: B. Johansen, NORCE

## Overview

- 5 day= 40 hrs
- 14 lectures, 8 hands-on sessions, 1 virtual field excursion, 1 mini-workshop
- 35 participants (17 SIOS members+ 18 Non-SIOS members), 11 teachers
- 150 registered participants for lecture series

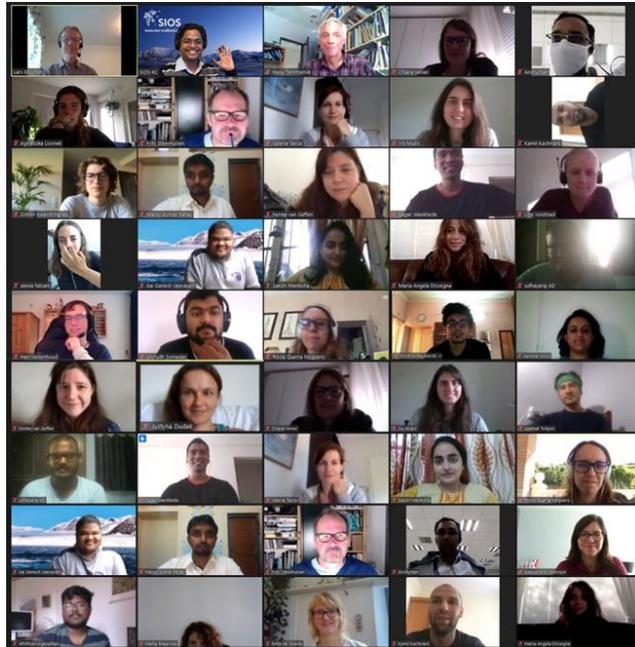
## Topics

- close range photogrammetry, drone applications,
- terrestrial vegetation mapping applications,
- thermal remote sensing, and interferometric SAR methods to support terrestrial research applications in Svalbard.



## Participants from 10 nations

10 PhD Students  
10 Masters/Bachelors Students  
07 Researchers  
05 Postdocs  
03 Research technician/Engineer



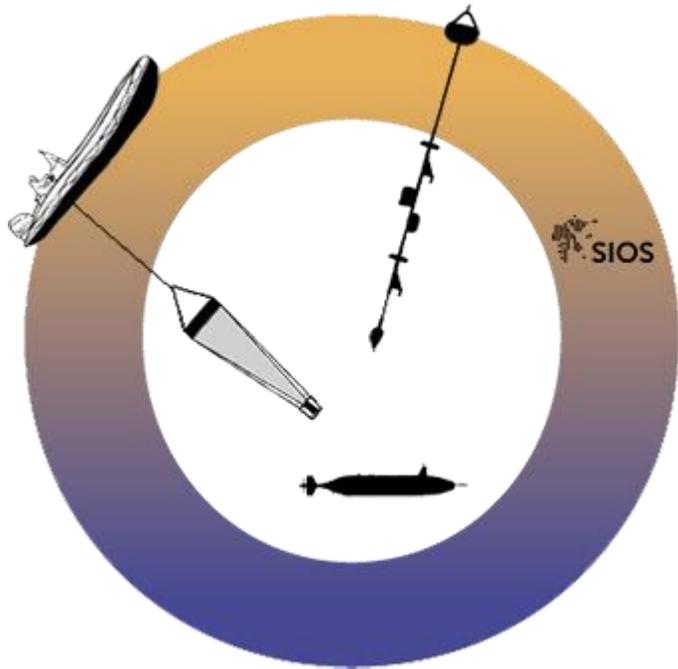
## Teachers and task force members

- Hans Tømmervik, Norwegian Institute for Nature Research, Norway
- Roberto Salzano, National Research Council of Italy, Italy
- Lars Eklundh, Lund University, Sweden
- Luc Girod, University of Oslo, Norway
- Darren Ghent, University of Leicester, UK
- Richard Hann, Norwegian University of Science and Technology, Norway
- Conrad Bielski, Eoxplore, Germany
- Tom Rune Lauknes, NORCE, Norway
- Rasmus Erlandsson, Norwegian Institute for Nature Research
- Bartłomiej Luks, Institute of Geophysics Polish Academy of Sciences
- Shridhar Jawak, SIOS Knowledge Centre, Svalbard



# Updates from SIOS-KC

## Registration for SIOS marine workshop now open!



The workshop has the following objectives:

- create a network of marine observatory systems within SIOS and increase its international visibility
- improve the interoperability between these systems
- stimulate data sharing and scientific cooperation
- develop joint projects
- optimize logistics relevant for operating the Marine Infrastructure

**Date:** 19th November 2020, 08:45 - 13:00 (CET)

# Updates from SIOS-KC

## SIOS Core Data WORKSHOP #1 – Registration open

The workshop will have two focus areas:

- critical analysis and revision of the SCD list and correction of variable definitions; and
- addressing the issue of the harmonization of measurements (measurement protocols, calibration) of SCD.

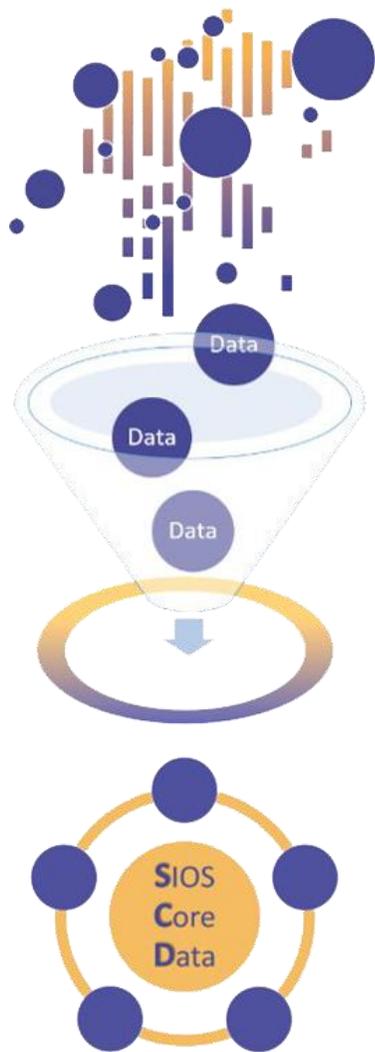
The workshop will also include training to support transforming SCD-candidates to SCD.

Planned outcomes:

- corrected variable definitions
- updated SCD list
- initiate workgroups for standardization of the SCD measurement protocols

**Form of the workshop:** 2-days online workshop

**Date:** 5 – 6 November 2020



# Updates from SIOS-KC

**PNW 2021 goes online!**



# Updates from SIOS-KC

## Multidisciplinary Workshop on snow

### Programme

- Deliverable 1: **'Agenda for the future of snow research in Svalbard'**
  - Document drafted by the task force
  - Potential **focal sites** for snow monitoring in Svalbard
  - **Remote sensing**/Earth observation of snow
  - Monitoring activities and **citizen science/education**
- Deliverable 2: **Technology development**
  - Exchange between researchers and engineers
  - Existing tools and potential innovation

### Date and location

- 1-2 and 4-5 February (3 h /day) - online



# Updates from SIOS-KC

## First ECR observer in the SIOS working group



**Will Harcourt**

University of St Andrews  
in Scotland

Around 10 applications received  
Reviewed by 4 RSWG members

The research interests of the SIOS Remote Sensing Working Group (RSWG) closely align with those of Will and was the driving force behind his motivation to join the group.

Will attended the 2020 Polar Night Week in Longyearbyen and became inspired by the efforts of the SIOS community to build a monitoring network that advances our understanding of the fragile Svalbard environment.

# Updates from SIOS-KC

## Announcement of Opportunity (AO) in Airborne Remote Sensing



Image courtesy of NORCE

- RGB camera and hyperspectral imager installed on Dornier aircraft stationed in Longyearbyen
- High resolution georeferenced images

### Available funding

- approximate 25 flight hours using the Dornier aircraft
- approximate 50 flight hours using drones
- First round of flights is closed
- Second round will be open at the end of 2020



Image courtesy of NORCE

# Updates from SIOS-KC

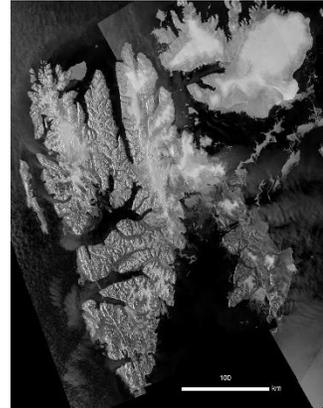
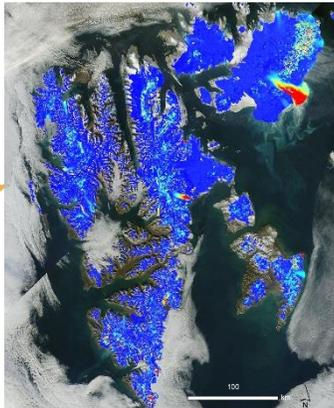
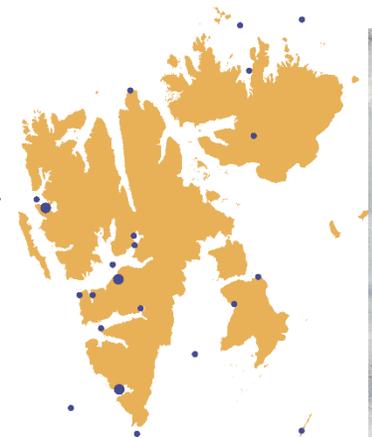
## Join the SIOS Virtual Hangout!

Every Friday at 9:30 Norwegian time





## Earth Observation (EO), Remote Sensing (RS), and Geoinformation (GI) Applications in Svalbard



### *Special Issue Editors:*

Dr. Shridhar D. Jawak

Prof. Dr. Andreas Kääh

Dr. Geir Moholdt

Dr. Malgorzata Blaszczyk

Ms. Ann Mari Fjæraa

Dr. Roberto Salzano

Prof. Dr. Veijo Pohjola

Prof. Hiroyuki Enomoto

Dr. Kjell Arild Høgda

Dr. Bo N. Andersen

Dr. Bartłomiej Luks

Dr. Frode Dinessen

### *Special Discount on Article Processing Charge (APC)*

**50% discount** for manuscripts

- from guest editors;
- from SIOS activities, e.g. [InfraNor](#), [SESS report](#), and [SIOS Access Projects](#).

**30% discount** for manuscripts

- invited by guest editors;
- submitted by authors from SIOS member institutes
- submitted by any PhD student as a first or corresponding author

This *Special Issue* will provide a broad platform to various regional and Svalbard-wide studies that are being conducted using EO/RS/GI.

We especially encourage contributors to provide access of data and products generated as a part of study via the SIOS data management system (SDMS).

# SIOS's special issue in EO/RS/GI applications in Svalbard

- 3 submissions in past 6 months
- 2 published
- 5 Early Career Researchers (ECRs) have been awarded during the SIOS online conference (04-05 June).

Open Access Article

## Does the Intra-Arctic Modification of Long-Range Transported Aerosol Affect the Local Radiative Budget? (A Case Study)

by Konstantina Nakoudi <sup>1,2,\*</sup> Christoph Ritter <sup>1</sup> Christine Böckmann <sup>3</sup> Daniel Kunkel <sup>4</sup> Oliver Eppers <sup>4,5</sup> Vladimir Rozanov <sup>6</sup> Linlu Mei <sup>6</sup> Vasilios Pefanis <sup>6,7</sup> Evelyn Jäkel <sup>8</sup> Andreas Herber <sup>7</sup> Marion Maturilli <sup>1</sup> and Roland Neuber <sup>1</sup>

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<sup>5</sup> Particle Chemistry Department, Max Planck Institute for Chemistry, Hahn-Meitner-Weg 1, 55128 Mainz, Germany

<sup>6</sup> Institute for Environmental Physics, University of Bremen, Otto-Hahn-Allee 1, 28359 Bremen, Germany

<sup>7</sup> Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Am Handelshafen 12, 27570 Bremerhaven, Germany

<sup>8</sup> Leipzig Institute for Meteorology, University of Leipzig, Stephanstr. 3, 04103 Leipzig, Germany

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(This article belongs to the Special Issue Earth Observation (EO), Remote Sensing (RS), and Geoinformation (GI) Applications in Svalbard)

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Open Access Article

## A 20-Year MODIS-Based Snow Cover Dataset for Svalbard and Its Link to Phenological Timing and Sea Ice Variability

by Hannah Vickers <sup>\*</sup> Stein Rune Karlsen and Eirik Malnes

NORCE Norwegian Research Centre AS, P.O. Box 6434, 9294 Tromsø, Norway

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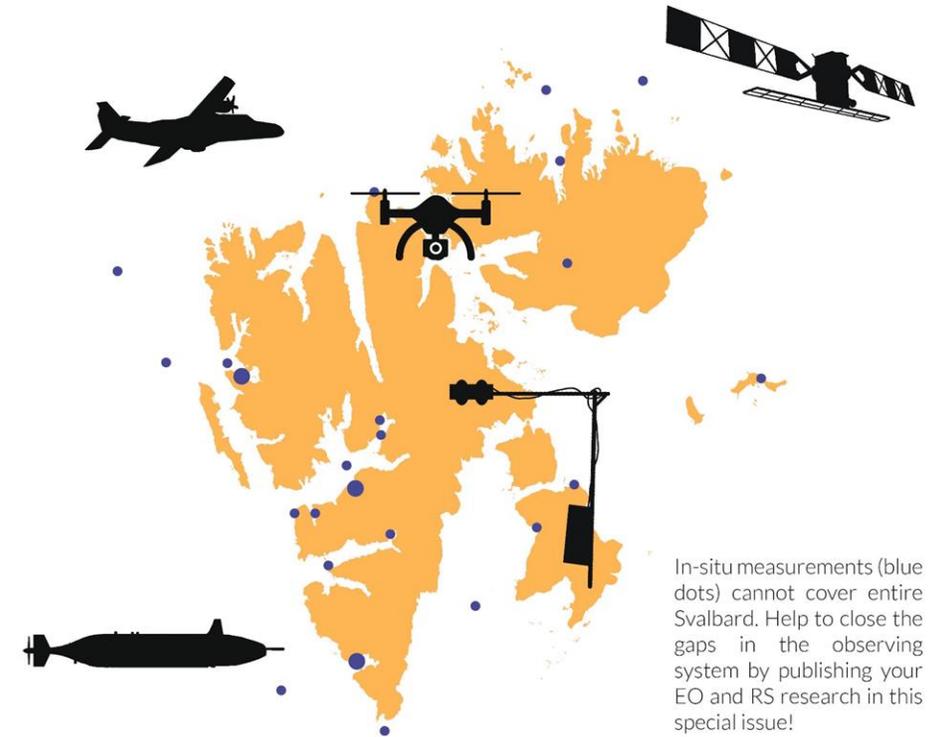
[Cite This Paper](#)



SIOS's special issue on  
Earth Observation (EO), Remote Sensing (RS) and Geoinformation (GI)  
applications in Svalbard

Open for submission!  
1 March 2020 - 31 December 2021

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In-situ measurements (blue dots) cannot cover entire Svalbard. Help to close the gaps in the observing system by publishing your EO and RS research in this special issue!

Check our website for details:

[www.sios-svalbard.org/SpecialIssueRemoteSensing](http://www.sios-svalbard.org/SpecialIssueRemoteSensing)



# SIOS Webinar #5:

23 October 2020, Friday: 15:00 - 16:30 (CEST)

## Grand Challenge Initiative (GCI) cusp rocket missions in Svalbard

Jøran Moen (UNIS):

GCI-Cusp history and its relevance to Svalbard studies

Andres Spicher (University of Oslo):

GCI-Cusp: an observing system for the dynamics of the upper polar atmosphere above Svalbard

Douglas Rowland (NASA):

The VISIONS-2 rocket mission: exploring atmospheric escape in the Earth's cusp

Kolbjørn Blix (Andøya Space Centre):

Grand Challenge Initiative - M/LT project



Illustration: Trond Abrahamsen (Andøya Space Center)



# Important Information

## **Audience:**

Please, please mute yourself on the zoom during the conference.

You can unmute yourself during the discussion session only while asking questions!

## **Presenters:**

Please try to finish your presentation within the time designated to you.

\*If you are crossing your time during the presentation, we may consider to interrupt you to conclude your presentation.

## **How to ask a question?**

Each session will be followed by a discussion session where you can ask you a question.

Alternatively, you can always enter your question in the chatbox and our team would keep a note of it.

**Feedback polls:** We will publish a live poll during the conference.

# Updates from SIOS-KC

## Svalbard Earth Observation and Remote Sensing User Forum

- To facilitate a dialogue between field scientists and remote sensing experts as well as within remote sensing expert community
- The user forum would be moderated by the RSWG members.
- Registered users would be able to post a question on the forum and in response, RSWG experts would answer the questions.
- RSWG members would provide this service as an in-kind contribution to SIOS.
- This would facilitate the engagement of RS and EO experts by direct dialogue between RSWG and users.