

Division Meeting Cryospheric Sciences

Olaf Eisen

EGU Vienna | 11 April 2019



Meetings | Publications | Outreach | www.egu.eu

- Division president elections 2019
- General Assembly meeting's statistics
- CR Programme – current implementation
- CR Officers and Secretaries, Medal committee
- Early Career Scientists & Outreach
- Medals and Awards
- Publication: The Cryosphere
- EGU activities
- AOB
- General discussion and feedback

Division president elections 2019

- past elections autumn 2017: CR president re-elected
 - appointed deputy-president GA 2018 - GA 2020:
Carleen H. Tilm-Reijmer
- **next elections in autumn 2019**
- newly elected CR president 2019 will become
 - division deputy president at the GA 2020
 - division president at the GA 2021
- put forward **several candidates** to have a reasonable election
(candidatures due in Sept. 2019)

GA 2019 statistics (as of 5 April 2019, 16:48)

- 16,250 abstracts in programme | -6.2% relative to 2018
- (16,922 active abstracts 29 Jan 2019)
- 5,531 orals | 9,432 posters | 1,287 PICOs | ratio 34 / 58 / 8
- 14,283 registrations in advance | +12.17%
- 683 unique scientific sessions | 87 short courses | 338 side events* (total 1108)
- 508 out of 683 scientific sessions are co-organized (74.4%), thereof 24 ITS
- Original sessions 1471; 1108 still active, 363 withdrawn

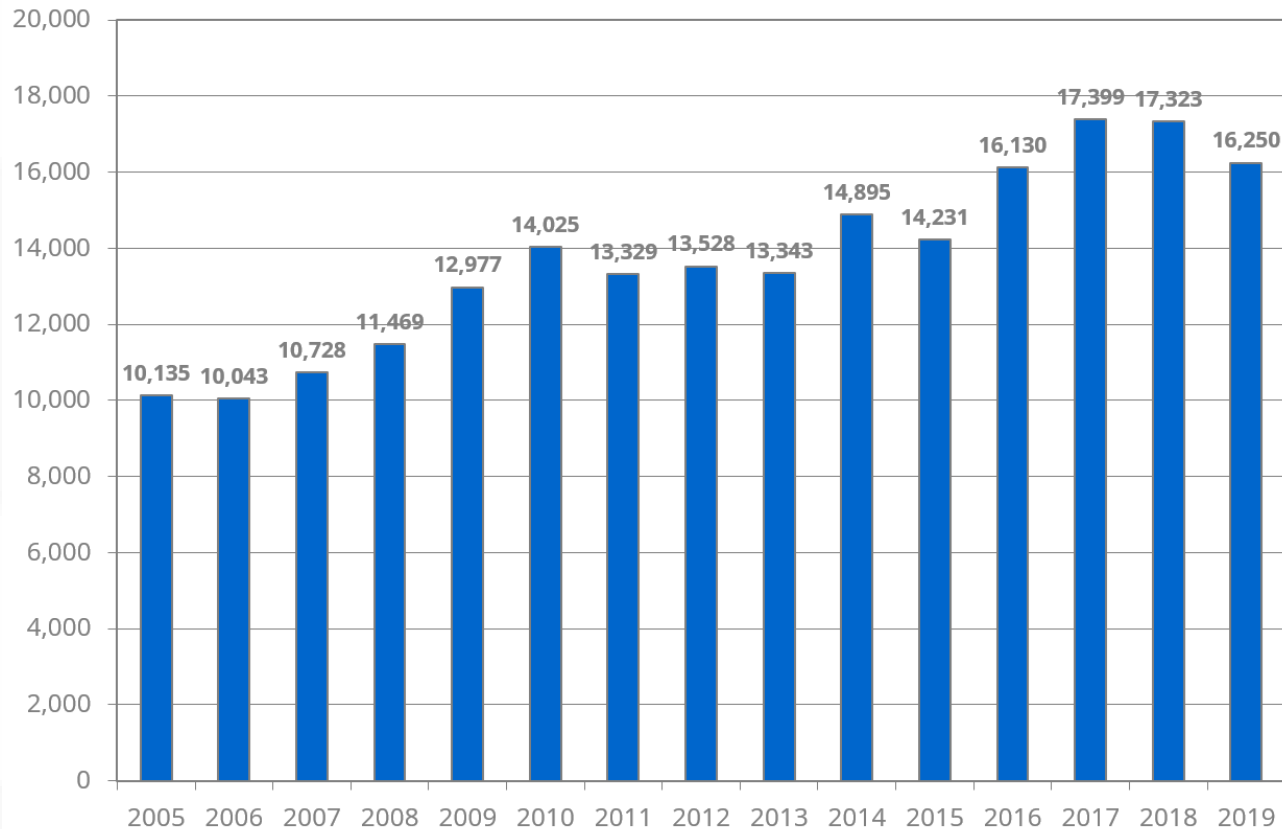
*Side events include the programme groups MAL, PCN, FAM, TSM, SEV, PC, PPAA

Programme 2005–2018

Abstracts in programme 2005 – 2019

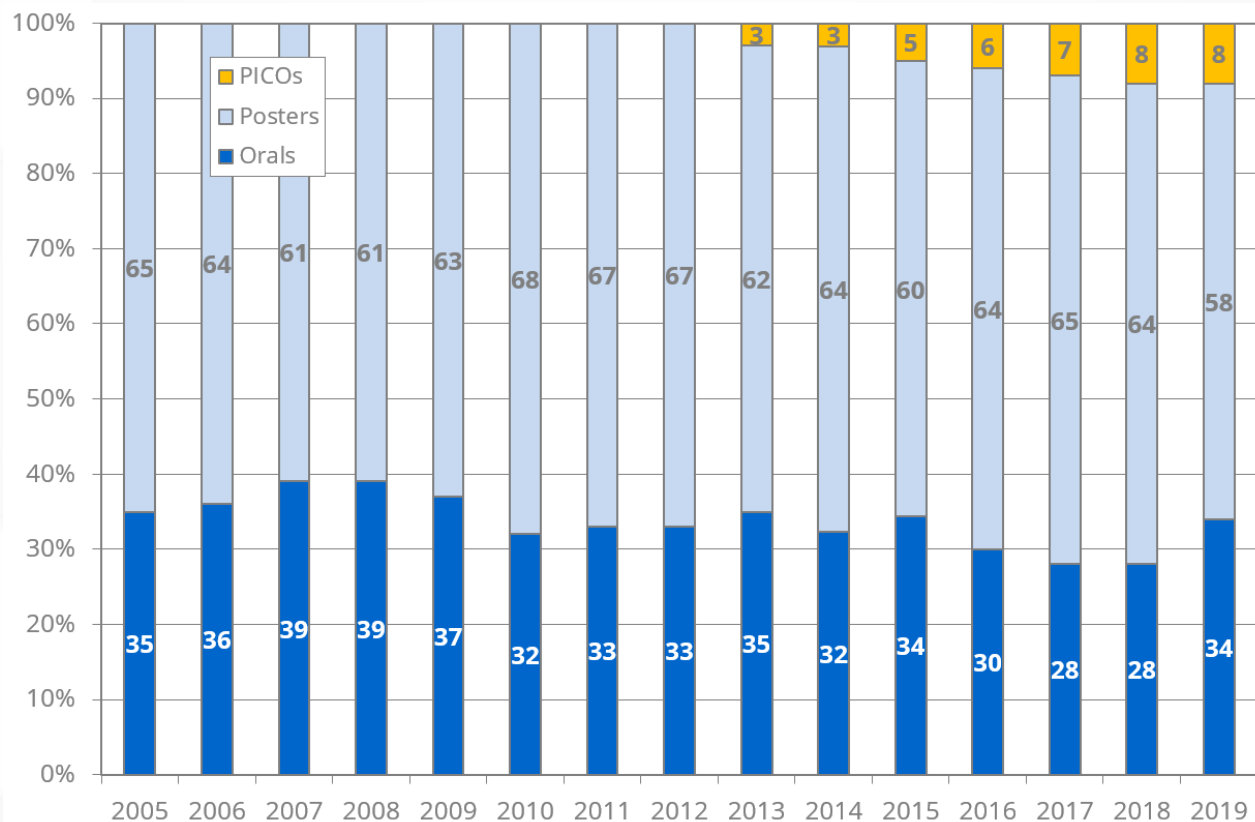
2018 withdrawal of no-show abstracts

2019 **one first-author** abstract rule



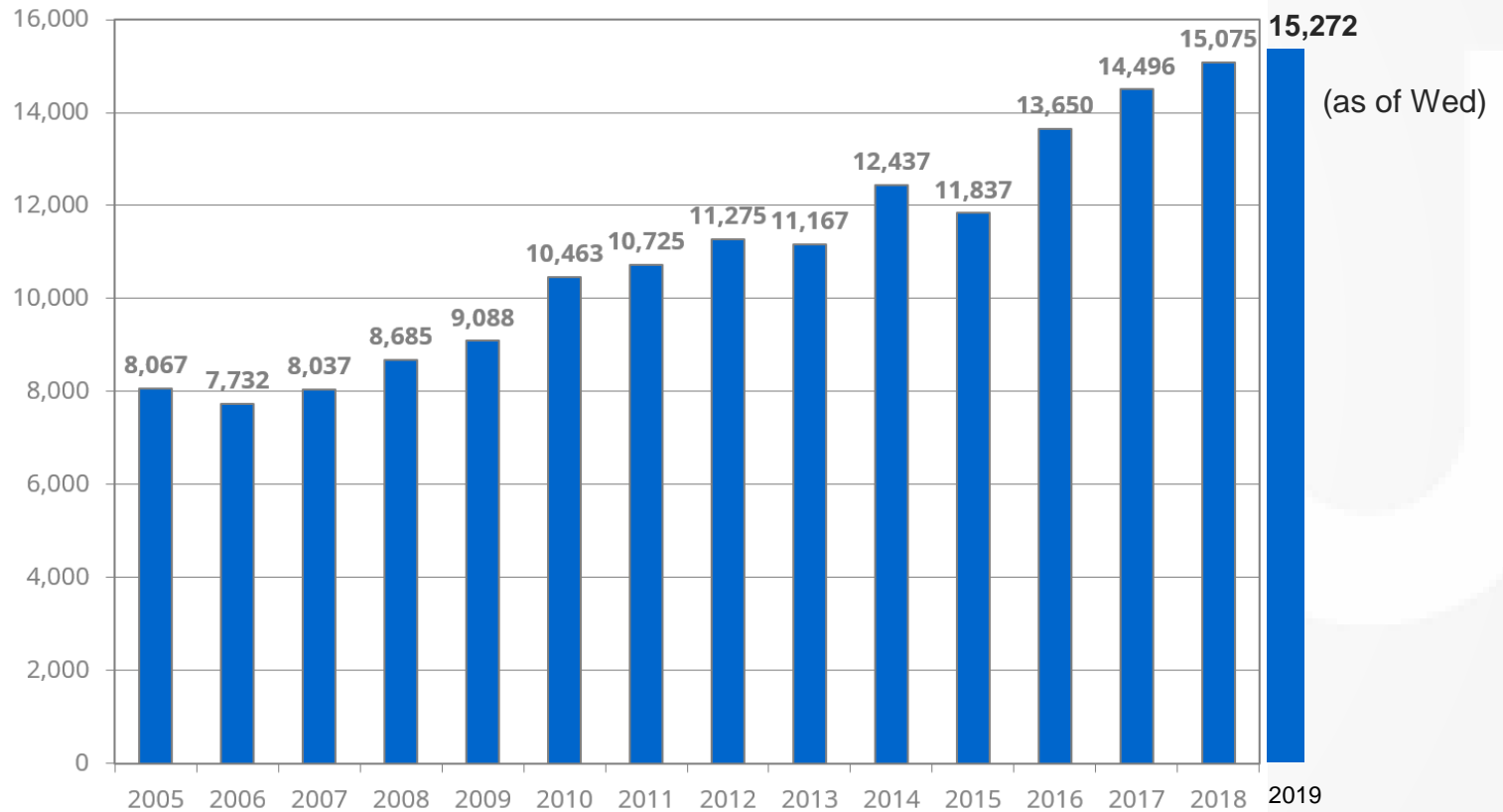
Programme 2005–2019

Presentation ratio 2005 – 2019



Programme 2005–2018

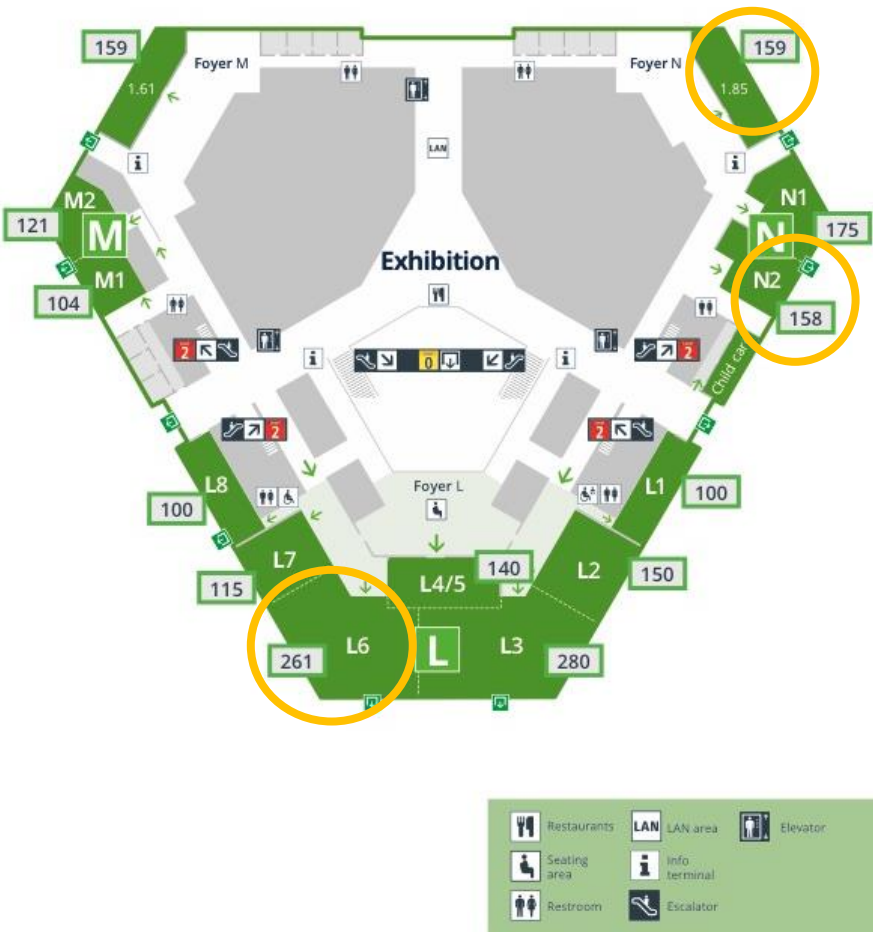
Participation 2005 – 2018



CR Statistics (CR org + CR co-org)

- 2019: **1206** abstracts ↑, 22 oral blocks | 6 PICOs
(CR org: 412 abstracts in 18 sessions: 20 oral blocks)
→ -17% **21 Abstracts/oral block**
- 2018: **1018** abstracts ↓, 22 oral blocks | 6 PICOs
(CR org: 512 abstracts in 21 sessions: 22 oral blocks)
→ -13% **23 Abstracts/oral block**
- 2017: 1179 abstracts ↑, 24 oral blocks | 5 PICOs
(CR org: 521 abstracts in 21 sessions: 24 oral blocks)
→ +9% **22 Abstracts/oral block**

Programme: Lecture room allocation



L6: 2 time blocks Mo

N2: 10 time blocks Wd-Fr

1.85: 8 time blocks Mo, Tu, Fr

New rules & actions for GA 2019

- **No solicited** presentations by conveners
- **(Co)-conveners should not be presenting author**, and are **discouraged** from being **co-author**, on **oral presentations** in a session they convene
- **1-abstract rule**: “Authors are allowed as first author to submit either one regular abstract plus one abstract solicited by a convener, or two solicited abstracts.”
- **Number of conveners on a session**: At session submission minimum 2 – maximum 5
- **Number of convenerships** as a recommendation: 1 as main convener, **maximum 3** (co-)convenerships total
- **Diversity!** f/m, ECS, ...

A greener General Assembly?

The EGU and Copernicus are working towards minimising the GA's carbon footprint. We need everyone's help!

- Come by train when possible. SBB offers a discount for GA participants
- Offset CO2 emissions from your travel. On-site terminal in entrance hall
- EGU Today online only
- No programme book
- Carpeting in poster halls X only (required for noise reduction)
- Water fountains (no single use bottles) – bring your own water bottle
- Bring your own coffee cup

Townhall meeting

'The carbon footprint of EGU's General Assembly'

Thursday, 19:00 – 20:00, room -2.47



<https://blogs.egu.eu/geolog/2019/03/05/make-your-egu-2019-experience-more-environmentally-friendly/>

Officers

- President/PC Chair: Olaf Eisen (2017-**2021**)
- Deputy President: Carleen Tijm-Rijmer (2017-)
- Medal Committee: Michiel van der Broeke (2015-)
- OSP Award Coord.: Nanna B. Karlsson (2017-)
- ECS Rep.:** **Emma Smith (2017-2019)**
- Publications: Thomas Mölg (2017-)
- Outreach: Sophie Berger (2017-)

Officers

President/PC Chair:	Olaf Eisen	(2017- 2021)
Deputy President:	Carleen Tijm-Rijmer	(2017-)
Medal Committee:	Michiel van der Broeke	(2015-)
OSP Award Coord.:	Nanna B. Karlsson	(2017-)
ECS Rep.:	Jenny Turton	(2019-)
Publications:	Thomas Mölg	(2017-)
Outreach:	Sophie Berger	(2017-)

Approved by DBM

Secretaries (-2019)

Sea Ice:	Michel Tsamados	(2016-)
Permafrost:	Christophe Grenier	(2015-)
Snow:	Marie Dumont	(2017-)
Glaciers:	Daniel Farinotti	(2018-)
Ice Sheets:	Heiko Gölzler	(2018-)
Ice Caps:	Harry Zekollari	(2018-)
Ice Shelves:	Reinhard Drews	(2018-)

New Secretaries: proposals invited Dec. 2018

Sea Ice:	Stefanie Arndt	(2019-)
Permafrost:	Ylva Sjöberg	(2019-)
Snow:	Marie Dumont	(2017-)
Glaciers:	Daniel Farinotti	(2018-)
Ice Sheets:	Heiko Gölzer	(2018-)
Ice Caps:	Harry Zekollari	(2018-)
Ice Shelves:	Irena Vankova	(2019-)

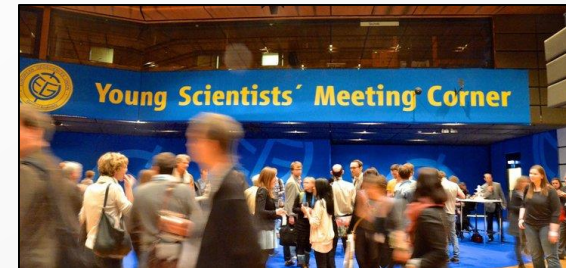
Approved by DBM

Cryosphere Early Career Scientist

*“... an undergraduate or postgraduate (Masters/PhD) student or a scientist who has received his or her highest degree (BSc, MSc, or PhD) within the past **seven years*** “*

**where appropriate, up to one year of parental leave time may be added per child)*

- ECS = 56% of Cryosphere Division (681)! (EGU: 52% - 8743)
- Divisional ECS Reps put together a strategy to guide union-wide ECS Rep
- Aim to actively shape the GA and wider EGU activity
- Represent issues and topics key to Earlier Career Scientists!



- Push for EGU to support CryoConnect Job Centre
- New: Networking and ECS Zone!
- Rules of conduct and trusted person
- Survey of funding bodies – who supports participants that present posters?
- Weekly blog posts:



EGU European Geosciences Union program#: JC1

Meet the Talents

Job Seekers: Present Yourself

Prepare a <2 minutes pitch for your future employer: what are **YOUR** interests, skills and talents? why do **THEY** want **YOU**?

Tue 9 AND Thu 11 April, between 18:00 - 19:00 **the stage is yours!**
*no subscription needed, just show up! where: EXHIBITION SPOT 1ST FLOOR



CR Cryospheric Sciences

Bridging the crevasse: working toward gender equity in the cryosphere

Elizabeth Case, Violaine Coulon and Florence Isaacs · March 8, 2019 · General Public · No Comments

CR ECS: The Team

Cryosphere ECS Rep

Blog Team

Social Media Team

Jenny Turton

Violaine Coulon Clara Burgard

Sophie Berger Calvin Shackleton



Plus regular blog authors and editors (in no particular order):

Adam Bateson, Céline Heuzé, Stephen Chuter, Rebecca Frew, Scott Watson, David Docquier, Donovan Dennis, Marie Cavitte, Joe Cook, Laura Helene Rasmussen, Lettie Roach, Liam Taylor, Chris Horvat

And many more blog contributors and short course conveners!

**We are always looking for new people –
contact jenny.turton@fau.de if interested!**

2 social events:

Pre-Icebreaker Meet-up (Sun) ~ 25 people

Cryo Drinks (Tue) ~ 80 people

3 Short Courses:

EGU Cryosphere and APECS Polar Career Panel (Tue)

How to find funding and write a research grant (Tue)

Meeting the Cryosphere Editor (Fri)

Frosty Paint!

Competition for children in EGU Childcare.

OSPP Participants: 66

Thanks to all volunteer judges!

Twitter account [@EGU_CR](#): 1485 followers

ECS Planner's Workshop (Emma)

Blog Editors Workshop (Sophie)



EGU Medals and Awards

- *Union medals*
 - Alfred Wegener Medal (senior late-career scientists)
- *Union awards*
 - Arne Richter Award for Outstanding EC Scientists
- *Union travel awards -> EGU Roland Schlich travel awards*
- ***Division medals and awards***
 - Julia & Johannes Weertman Medal
(`mid-term´ scientist)
 - Outstanding Young Scientist Award
 - Outstanding Student Poster Award (OSPoP)
 - Outstanding Student PICO Award (OSPiP)

Deadline for proposing candidates for 2020 is **15 June 2019**.
Detailed guidelines www.egu.eu/awards-medals

Louis Agassiz Medal Lecture by Andreas Kääb

Mon, 8 April, 19:00-20:00 / Room K2



The 2019 Louis Agassiz Medal is awarded to Andreas Kääb for innovative and multidisciplinary contributions to the field of remote sensing of the cryosphere, with applications in glacier mass balance, permafrost and geohazards.

Renaming of CR Louis Agassiz medal

Based on historical evaluations EGU Council voted for a change of name:

ANNOUNCEMENT

EGU Louis Agassiz Medal renamed to honour Julia and Johannes Weertman

CR Division Outstanding Early Career Scientists Award → Arne Richter Award

Thr, 11 April, 12:00-12:30 / Room N2



The 2019 Arne Richter Award for Outstanding Early Career Scientists is awarded to Marie Dumont for outstanding contributions to the field of snow sciences.



Outstanding Student PICO/Poster Award

Fanny Brun

The 2017 Outstanding Student Poster and PICO (OSPP) Awards is awarded to Fanny Brun for the contribution entitled:

Can ice cliffs explain the “debris-cover anomaly”? New insights from Changri Nup Glacier, Nepal

(& Wagnon, P.; Berthier, E.; Kraaijenbrink, P.; Immerzeel, W.; Shea, J.; Vincent, C.; Reverchon, C.; Shresta, D.; Arnaud, Y.)



Motivations

Ice cliffs are **major contributors** to debris-covered glacier mass loss [Buri et al., 2016] and exhibit **highly variable** temporal changes [e.g. Thompson et al., 2016; Watson et al., 2017]. Our goal is to quantify the **total contribution** of ice cliff retreat to the tongue net ablation of Changri Nup glacier and of other debris-covered glaciers of the Everest region between **Nov. 2015, Nov. 2016 and Nov. 2017**.

Study area

Datasets

Terrestrial photogrammetry
 < 5 cm
 10 000 m²

UAV
 20 cm
 10 km²

Pléiades DEM
 2 m
 150 km²

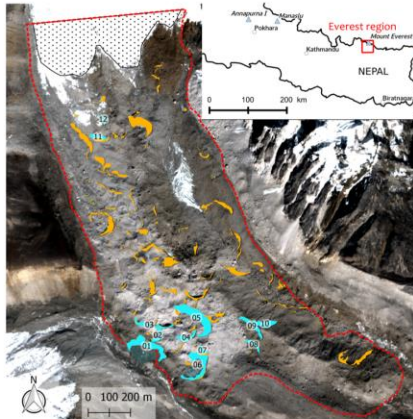


Fig. Map of the study area. The light blue shapes are the twelve cliffs surveyed with the terrestrial photogrammetry and the orange shapes are all the other cliffs of the tongue. The background image is the Pléiades images of November 2016 (copyright:CNES 2016, Distribution Airbus D&S).

Glacier flow correction: the importance of the emergence velocity

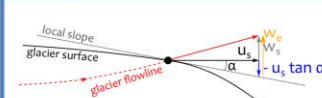
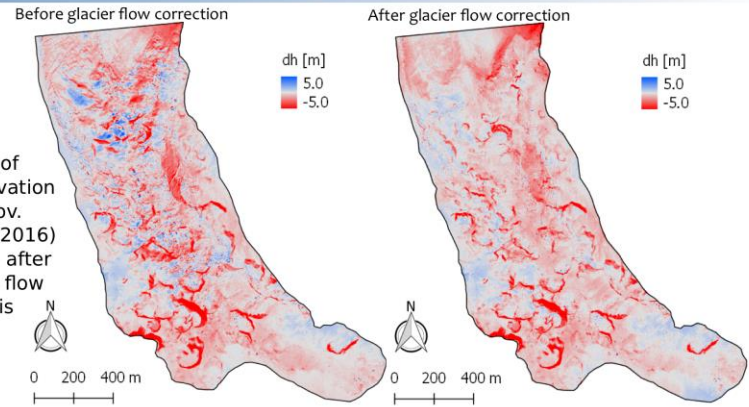


Fig. 3D displacement of the glacier surface

Using a **flux-gate approach**, it is possible to calculate the mean glacier tongue **emergence velocity** (0.33 m/yr). The surface horizontal velocity (up to ~12 m/yr) was measured with Pléiades images correlation.

We assumed spatially constant emergence velocity and applied a glacier flow correction to each datapoint of the point clouds.

Fig. maps of glacier elevation change (Nov. 2015-Nov. 2016) before and after the glacier flow correction is applied



Total contribution of ice-cliff backwasting

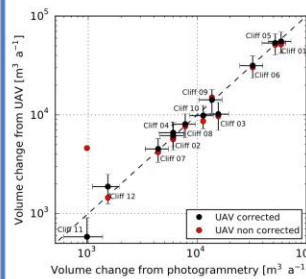
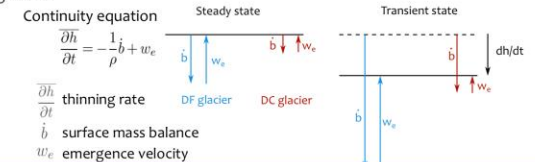


Fig. comparison between volume loss estimated from the terrestrial photogrammetry and the UAV data for the twelve field surveyed cliffs

We **validated** the volume loss calculation obtained from UAV DEMs with the volume loss calculated from the terrestrial photogrammetry [Brun et al., 2016]. For the period November 2015 to November 2016 and November 2016 to November 2017, ice cliffs contributed to **23 +/- 5 % of the total tongue net ablation**, even though they occupied only 7-8 % of its surface. The mean ablation rate for the ice-cliffs is **3 times higher** than the mean glacier tongue ablation rate. This study provides the first estimate of ice-cliff volume loss at the scale of a glacier tongue based on UAV and Pléiades DEMs (and field monitoring for the ice thickness).

Ice cliffs and the "debris-cover anomaly"

Vincent et al. (2016) showed that the ablation was reduced on the debris-covered tongue of Changri Nup Glacier, compared with a neighboring debris-free tongue. We calculated that the cliffs should occupy 75 % of the tongue surface to achieve the same ablation rate than a debris-free tongue, under similar conditions. Similar thinning rates between debris-free and debris-covered tongues are likely due to the fact that the combination of reduced emergence velocities and lower ablation over debris cover tongues coincidentally sum up to similar thinning rates as debris-free glaciers.



References
 Brun, F. et al.: Quantifying volume loss from ice cliffs on debris-covered glaciers using high resolution terrestrial and aerial photogrammetry, *J. Glaciol.*, 62,684–695, 2016.
 Buri, P. et al.: A grid-based model of backwasting of supraglacial ice cliffs on debris-covered glaciers, *Ann. Glaciol.*, 57, 199–211, 2016.
 Thompson, S. et al.: Stagnation and mass loss on a Himalayan debris-covered glacier: processes, patterns and rates, *J. Glaciol.*, 62, 467–485, 2016.
 Vincent, S. et al.: Reduced melt on debris-covered glaciers: investigations from Changri Nup Glacier, Nepal, *The Cryosphere*, 10, 1845–1858, 2016.
 Watson, C.S. et al.: Ice cliff dynamics in the Everest region of the Central Himalaya, *Geomorphology*, 278, pp.238–251, 2017.
 This work has been supported by the French Service d'Observation GLACIOCLIM, the French National Research Agency (ANR) through ANR-15-SEN-0005-04 PRESHINE, and has been supported by a grant from Labex OSUQ@2020 (Investissements d'avenir - ANR10-LABX-59). Funding for the UAV survey was generously provided by the United Kingdom Department for International Development (DfID) and by the Ministry of Foreign Affairs, Government of Norway. This project has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement No 678393). E.B. acknowledges support from the French Space Agency (CNES) and the Programme National de Télédétection Spatiale grant PNTS-2016-01. F.B., P.W., C.V. and Y.A. are part of Labex OSUQ@2020 (ANR10-LABX-59).



Outstanding Student PICO/Poster Award Sandra Vázquez-Martín

The 2017 Outstanding Student Poster and PICO (OSPP) Awards is awarded to Sandra Vázquez-Martín for her contribution entitled:

*Ground-based in-situ snowfall speed measurements:
Microphysical properties of snowflakes*

(& Kuhn, T.; Eliasson, S.)



sandra.vazquez.martin@ltu.se

Ground-based in-situ snowfall speed measurements: Microphysical properties of snowflakes

Sandra Vázquez-Martin¹,
Thomas Kuhn¹, Salomon Eliasson²

1. LTU (Luleå University of Technology), Sweden
2. SMHI (Swedish Meteorological and Hydrological Institute), Sweden

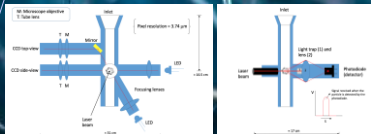
INTRODUCTION AND STUDY AREA

Accurate knowledge of atmospheric snow particles (ice crystals and snowflakes) microphysical properties (size, particle size distribution, surface area, area ratio, shape and fall speed) is essential for meteorological forecast and climate models. For instance, they can help improve parameterizations of snow particles in atmospheric models. In order to measure these properties, in our study case we use ground-based in-situ optical instruments.

METHODOLOGY



FIG. 1. Ground-based in-situ snowfall measurement instrument.



Snow crystal classification system of Magono-Lee

FIG. 2. Snow crystal classification system of Magono-Lee.

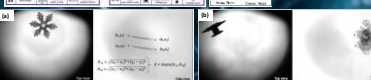


FIG. 3. Snow crystal classification system of Magono-Lee. Left: Original image. Right: Image after background removal and particle segmentation.



FIG. 4. Snow crystal classification system of Magono-Lee. Left: Original image. Right: Image after background removal and particle segmentation.

CONCLUSIONS

- Our instrument collects all kinds of snow particles in Kiruna covering sizes from 50 µm to 3 mm.
- Our instrument measures the area and fall speed of individual snowflakes.
- Our data is useful for improving parameterizations for climate and forecast models.

DATA AND RESULTS

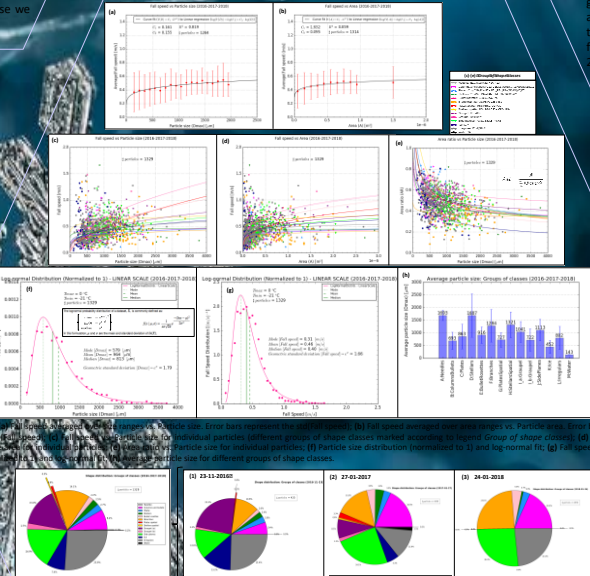


FIG. 5. Shape distributions for some snowfall events during 2016-2017. Left: Coverage. Right: Snowfall event.

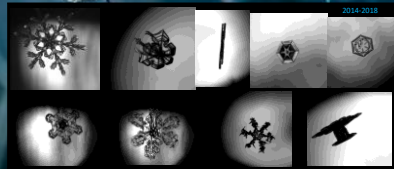


FIG. 6. Snow crystal classification system of Magono-Lee. Left: Original image. Right: Image after background removal and particle segmentation.

ABSTRACT

In this work, we present new measurements of snowflakes' microphysical properties using our ground-based Dual - Ice Crystal Imager (D-ICI) instrument that takes high-resolution side- and top-view images of snowflakes. Size, area, and fall speed of the snow particles are determined from the images. Their shapes are classified in needles, columns and bullets, plates, stellars, bullet rosettes, graupel, irregular, and also ice and water droplets. In addition, we analyze the relationships between these microphysical properties. We show results from several snowfall events in Kiruna, Sweden from 2014 to the present.

HOW SNOWFLAKES GET THEIR SHAPE?

During early growth, local conditions may favor columnar or plate growth. As a snowflake grows and precipitates it encounters always changing temperature and humidity resulting in a variety of growth habits. Under certain conditions, branching instabilities may cause corners to grow out as branches. Changing conditions could then favor, for example, growth of new plates, the formation of new arms/branches on the new plates, and so on. The final result is a great variety of shapes of snowflakes, such as, needles, stellars, plates, graupel and so on.

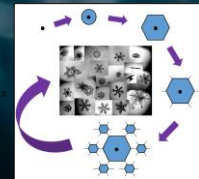


FIG. 7. Snowflake growth stages from a small ice crystal to a complex snowflake shape.

FUTURE WORK

- Continue measurements and compare our data (from 2018) with other ground-based in-situ instruments located in Kiruna.
- Automate snowflake determination and fall speed analysis.
- Update our shape classification system with new snowflakes.
- Microdata analysis of fall speed and shape.
- Comparison with radar snowfall measurements.



FIG. 8. Ground-based in-situ snowfall measurement instrument in operation.

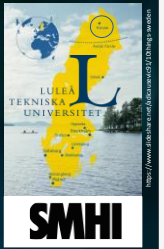
REFERENCES:

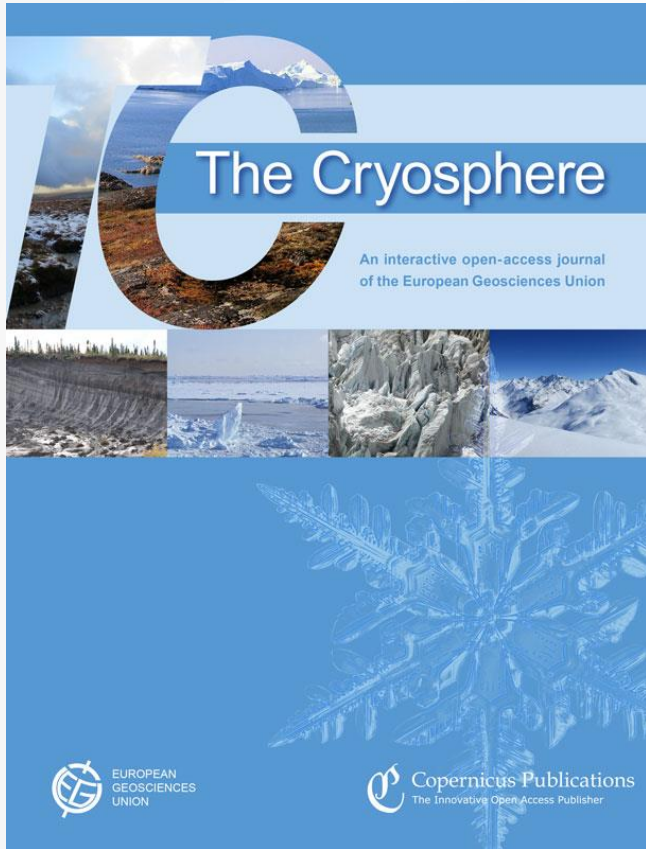
- [1] Magono, C. W. Lee, Meteorological classification of natural snow crystals, J. Fac. Sci. Hokkaido Univ. Vol. II (4) (1966) 232-255
- [2] Libbrecht, Ken Libbrecht's Field Guide to Snowflakes, 2006.

Ground-based in-situ snowfall measurement instrument



Acknowledgments:





- Open access – IF₂₀₁₇ 4.5 (4.8, 4.9)
- The leading journal in its field
- 2018 #: TCD: 285, TC: 260
- Co-Editors-In-Chief:
 - Florent Dominé – snow
 - Christian Haas – sea ice
 - Christian Hauck – permafrost
 - Thomas Mölg – glaciers
 - Olaf Eisen – ice sheets



Open Access: DEAL agreement with Wiley

- AGU/Wiley: 2750 €/article – now with open access without extra fee under DEAL

For comparison (average values):

- EGU/Copernicus: 1500 €/article – all open access
- Global average: 3800 €/article – includes costs libraries/institutions have to pay for subscription

- GA & Galileo Conferences (two in 2019)
- Conference Series (three per year)
- Training schools (18 supported in 2019)
call: 1 June 2019
- Publications
- Awards
- Outreach
- Newsletter
- Early Career Scientists
- *imaggeo photo contest: **vote closes today***

EGU GA 2020 timeline

General Assembly: 3–8 May 2020

01 Jun – 20 Jun 19	Call-for-skeleton. Only sub-programme structure (headers), no session roll-over! Conveners: ECS & gender balance
24 Jun – 05 Sep 19	Public call-for-sessions Includes GDB and US
09 Sep – 09 Oct 19	Session programme finalization
01 Dec 19	Deadline support application
15 Oct 19 – 15 Jan 20	Abstract submission

Discussion: Suggestions for EGU2020:

1. EGU 2020: all **oral talks** in CR division by ECS only
2. **Session chairs** who have chaired for 4 or more years will
 - i) step down
 - ii) be replaced by someone from different institutes (no age limitations)
3. No one should chair similar or **identical sessions** at both AGU and EGU in same year.
4. No one should be an **editor of an EGU journal** while being an editor of AGU, Frontiers (review editors excluded), and IGS journals.

Approved by DBM – indicative vote item 2: majority >80% for 2/3 ECS



ECRA has four collaborative programmes.

The [Arctic Climate Stability and Changes](#) programme is looking for a **new lead**.

Arctic ECRA is open to new participants. The CP is also looking for one or two persons to take on the lead in the future. For any questions, do not hesitate to contact the ECRA Secretariat or the current lead,

*Lars H. Smedsrud,
Bjerknes Centre for Climate Research, NO
Lars.Smedsrud@uib.no.*

- New program structure = more orals -> opinion?
- Free coffee everywhere again (not only poster hall)
- Carbon offset compensation = default
- Networking session (former poster session)?
- Noise reduction (PICOs, posters)?
- Suggestions for improving the programme ?
- EGU today only digital
- Session roll over?

- Please propose sessions and conveners for 2020!

EGU GA 2020: 3-8 May

A scenic landscape featuring a waterfall cascading over rocks into a pool of water. The background shows a wide, flat expanse under a blue sky. A large, bright yellow speech bubble is overlaid on the scene, containing the text 'Please Give Us Feedback!'.

**Please
Give Us
Feedback!**

www.egu2019.eu/feedback

Posters:

- + More time for posters now
- + Better than expected, better than at AGU
- + During day good, but
- PICO much more difficult with poster sessions (noise)
- Some posters put up too late, some taken down after attendance

Suggestions:

- o No need to have posters at 8h30. From 10h45 on fine, people not up to discussing posters at 8h30 (majority had that opinion).
- o Networking slot: emphasize that authors should try to be in poster attendance
 - > Pool session posters to do so!
- o Distribute draft program to conveners

Orals: 2/3 should be from ECS (vote: no rule, 2/3, ECS only)

Editor EGU journal: Only one editorship in thematically equal journals seems natural

Session convener:

- no roll-over partly solves problem of having same convener every year
- people should have opportunity to express interest for convening

Carbon: include train travel in registration (calculation has been done!)