

# ICE



***NEWS BULLETIN  
OF THE INTERNATIONAL  
GLACIOLOGICAL  
SOCIETY***





# Ice

## News Bulletin of the International Glaciological Society

---

Number 172

3rd Issue 2016

### Contents

- |   |  |
|---|--|
| <b>2 From the Editor</b>  | 18 Presentation of Honorary Membership to Professor Keiji Higuchi  |
| 4 <i>Blog: New Chief Editor for the International Glaciological Society</i> | 19 New office for the IGS  |
| <b>5 International Glaciological Society</b>                                | 20 Second Circular: International Symposium on Polar Ice, Polar Climate, Polar Change, Boulder, CO, USA, August 2017 |
| 5 <i>Journal of Glaciology</i>  | 32 First Circular: International Symposium on Cryosphere and Biosphere, Kyoto, Japan, March 2018                     |
| 7 Creative Commons licensing  | <b>36 Glaciological diary</b>  |
| 8 Report on the IGS Symposium La Jolla, CA, July 2016                       | <b>39 New members</b>  |
| 13 Report on the British Branch Meeting, Southampton, September 2016        |  |
| <b>15 News</b>  |  |
| 15 Report from the Summer School, McCarthy, Alaska, June 2016               |  |

*Cover picture:* Glacier de Gébroulaz, Vanoise, France, August 2015. Measurements of flow velocity, thickness variation and mass balance are taken several times a year on this glacier by Glacioclim (Laboratoire de Glaciologie et Géophysique de l'Environnement, Grenoble, France). Photo by Coline Bouchayer.

**EXCLUSION CLAUSE.** While care is taken to provide accurate accounts and information in this Newsletter, neither the editor nor the International Glaciological Society undertakes any liability for omissions or errors.

# From the Editor

Dear IGS member

Welcome to the third and last issue of ICE for 2016. In this editorial I would like to discuss IGS symposia and in particular our registration fees. We are regularly criticized for setting the registration fees too high and told that people will be unable to attend because of that. I do agree that it is not cheap to attend IGS symposia but we have to look at this in perspective, i.e. what do you get for your money?

Let me first say that at every IGS symposium a number of delegates come up to me as we are getting near the end of the meeting and thank us as the organisers for a wonderful event. People say that IGS symposia are consistently their favourite meetings as they are very focused and at the same time very personal. They also mention the numerous opportunities to link up with colleagues in the pleasant surroundings of a typical IGS symposium and that the social side of the meeting is very interesting and enjoyable. Delegates like the size of the meetings, which contributes to their intimacy and the ease with which they can approach fellow delegates, and also like the way that everything takes place with all the participants as a single group.

So how do we do it?

We supply excellent refreshments at both at the morning and the afternoon breaks; everyone is there during the

breaks (as opposed to running across the street looking for a Starbucks and once there waiting in line for half an hour) so this is an excellent opportunity to grab the speakers from the previous session and discuss their presentations. Quite often small discussion groups form during the coffee breaks for precisely this purpose. Very often we provide lunches, especially if there is a shortage of eateries near the venue. Again, this provides a very good opportunity to continue discussion of symposium topics over lunch, an opportunity that delegates make full use of, and it eliminates time they otherwise must spend away from the venue hunting down a bite to eat.

We always put on an 'Icebreaker' reception, with food and refreshments, during the afternoon/evening before the regular sessions start. This is where you meet up with your fellow delegates for the first time. The registration desk is also open during the Icebreaker for your convenience.

Then of course there is the 'Banquet'. This is typically held towards the end of the symposium. It can be quite a lavish affair, and is one that most delegates attend. Often we use the Banquet to show our appreciation to the local people who have helped us organize and prepare for the meetings.



Mid-week excursions are organized to break up the week and give delegates a chance to escape the stuffy lecture halls, see the sights and experience the location where the symposium is held. This makes a great deal of sense, because IGS symposia are in new venues every year and delegates regard this as an opportunity to 'see the world' more than is possible if always attending meetings in the same venues.

In addition to all this we quite regularly have an additional evening social event. This could mean that half your evening meals are included in the symposium fee. At our last symposium, in Wellington, New Zealand, we added an evening meal to the mid-week excursion. At the symposium before that, held in La Jolla, California, USA, we had an evening reception at the stunning home of pioneering oceanographer Walter Munk. Thus, during the La Jolla meeting, delegates only had to purchase five breakfasts (avoidable, considering the lavish finger food supplied for the morning coffee break) and two dinners during the entire Sunday night through Friday afternoon symposium period.

All this is included in the registration fee.

As you can now appreciate, our symposia are quite elaborate affairs and they seem to be very popular with delegates. Yes, the registration fee is more than that of, say, the AGU or the EGU, but if we were to strip everything I have listed above from the symposium the price would be less than what we are charged to attend the AGU and EGU. This option has been discussed at various times but invariably the verdict is 'it would not be an IGS symposium then'.

In addition, we make every effort to make cheap accommodation available to delegates, in particular to students. Those of you who have paid for hotel accommodation in the vicinity of the Moscone Centre in San Francisco at a typical AGU meeting will definitely appreciate the value of this.

I would like to finish by pointing out that the IGS does not make any profit whatsoever from symposia, in fact we have typically made a small loss at recent meetings.

I hope that you now will understand better the reasons behind the registration fees and that you will continue to patronize the events and symposia organized by the IGS and our co-sponsors all over the world.



# Blog: New Chief Editor for the International Glaciological Society

**Q: What is the best way to chief-edit a journal like the *Journal of Glaciology*?**

**A: I'll let you know ...**

One good provisional answer – and I am relying on it heavily just now – is ‘Like Jo Jacka’, because he has been outstanding at steering the Journal forward through times of rapid growth and change and at maintaining its position at the top of the list of journals in the cryospheric sciences.

Like other ‘retired’ glaciologists, I have lots of experience of editing from the receiving end, as author and reviewer, but from the transmitting end it is a curious occupation. I have some earlier experience of it as a scientific editor for various issues of the *Annals of Glaciology*, and some recent experience as the chief editor of issue 71 of the *Annals*, the theme of which was *Glaciology in High Mountain Asia*. Seen from the outside, the editor is an all-powerful patriarch (of either sex) who sends you occasional advice and frequent decisions, not all of them what you wanted to hear. From the inside, the first thing that strikes you, or at least me, is that in the long run the advice is more important than the decisions. Even the unwelcome decisions (which are no fun for the editor either) can help authors to sharpen their scientific focus and clarify their thinking (and their syntax).

The second striking thing is that a guiding principle emerges from the first striking thing: The journal is there for the benefit of its readers, not its authors. The journal would be nowhere without its authors, but it cannot flourish unless people read it, preferably avidly. In my career as a teacher, I invariably found muddled writing to be a reliable pointer to underlying muddled thinking. Exposing and eliminating ambiguity and obscurity is the main service that editors and reviewers can offer to aspiring authors. This guiding principle may help to explain to puzzled authors why the editor or reviewer is asking them to insert or remove commas and hyphens, to make sure that all citations are referenced and all references are cited (one of the most tedious jobs I know of), and even occasionally to remove adverbs that are splitting infinitives but doing no work.

What about my own work? I used to be a field worker, but for the past three or four decades I have been a desk glaciologist (with spells as a hydrologist, climatologist and geomorphologist).

I spend long hours in front of a computer and know quite a lot about computing (old-timers may be impressed by the fact that I once spent six weeks disassembling ANSI.SYS) and a bit about mathematics (long ago I published a paper about a map projection that turned out to be a Riemann surface of three sheets), but I remain convinced of the fundamental importance of raw measurements. In fact, most of my research time is spent reading papers written by colleagues about measured mass and area changes of glaciers, and imposing a uniform format on the data.

At the same time I have always been drawn strongly to theories and in general to ideas, without having produced many of either. In my view the most exhilarating recent event in (or near) glaciology was the appearance in *Nature* (2016, **534**, 79–81 and 82–85) of two papers each arguing convincingly that the molecular-nitrogen ice on the surface of Pluto is convecting. The authors were planetologists, but we – by which I really mean T.J. Hughes (1976, *Journal of Glaciology*, **16**(74), 41–71) and L.A. Lliboutry (1987, *Very Slow Flows of Solids*, Springer) – were 40 or more years ahead of them.

One of the things I sometimes wonder about is the balance of subjects in the *Journal of Glaciology*. Hilda Richardson, the first secretary of the Society, and her contemporaries always insisted that glaciology is the study of ice, not just of glaciers. So why does the *Journal* never publish papers about extraterrestrial ice? In a wider perspective, although as a reader I quite like the current balance of subjects, I have an open mind about the mix that we should tolerate or encourage in future.

I may seem patriarchal, but I am not the boss, and I hope that those who write for the *Journal of Glaciology* and those who read it will be generous with their support of me and the other new Associate Chief Editors as we try to broaden and deepen our common understanding of ice – and glaciers.

**Graham Cogley, June 2016**

Reproduced from <http://blog.journals.cambridge.org/2016/06/29/new-chief-editor-for-the-journals-of-the-international-glaciological-society/> by kind permission of Cambridge Core.



# International Glaciological Society

## *JOURNAL OF GLACIOLOGY*

Papers accepted for publication between 1 September and 31 December 2016. The papers are listed in alphabetical order by first author. Some of these papers have already been published.

**Vibhor Agarwal, Tobias Bolch, Tajdarul Syed, Tino Pieczonka, Tazio Strozzi, Rishabh Nagaich**  
Area and mass changes of Siachen glacier (east Karakoram)

**Tom Cowton, Andrew Sole, Peter Nienow, Donald Slater, David Wilton, Edward Hanna**  
Controls on the transport of oceanic heat to Kangerdlugssuaq Glacier, east Greenland

**Nicolas Cullen, Brian Anderson, Pascal Sirguey, Dorothea Stumm, Andrew Mackintosh, Jonathan Conway, Huw Horgan, Ruzica Dadic, Sean Fitzsimons, Andrew Lorrey**  
An eleven-year record of mass balance of Brewster Glacier, New Zealand, determined using a geostatistical approach

**Daniel Falaschi, Tobias Bolch, Philipp Rastner, María Lenzano, Luis Lenzano, Andres Lo Vecchio, Silvana Moragues**  
Mass changes of alpine glaciers at the eastern margin of the Northern and Southern Patagonian Icefields between 2000 and 2012

**Yongmei Gong, Thomas Zwinger, Stephen Cornford, Rupert Gladstone, Martina Schäfer, John Moore**  
Importance of basal boundary conditions in transient simulations: case study of a surging marine-terminating glacier of Austfonna, Svalbard

**G. Hilmar Gudmundsson, Jan de Rydt, Thomas Nagler**  
Five decades of strong temporal variability in the flow of Brunt Ice Shelf, Antarctica

**Yoichi Ito, Florence Naaim-Bouvet, Kouichi Nishimura, Hervé Bellot, Emmanuel Thibert, Xavier Ravanat, Firmin Fontaine**  
Measurement of snow particle size and velocity in avalanche powder clouds

**Jessica Lundin, C. Max Stevens, Robert Arthern, Christo Buizert, Anais Orsi, Stefan Ligtenberg, Sebastian Simonsen, Evan Cummings, Richard Essery, Michiel Helsen, Will Leahy, Paul Harris, Edwin Waddington**  
Firn Model Intercomparison Experiment (FirnMICE)

**Kenneth Mankoff, Jason Gulley, Slawek Tulaczyk, Matthew Covington, Xiaofeng Liu, Yunxiang Chen, Doug Benn, Piotr Glowaci**  
Roughness of a subglacial conduit under Hansbreen, Svalbard

**Sergey Marchenko, Veijo Pohjola, Rickard Pettersson, Ward van Pelt, Carmen Vega, Horst Machguth, Carl Böggild, Elisabeth Isaksson**  
A plot-scale study of firn stratigraphy at Lomonosovfonna, Svalbard, using ice cores, borehole video and GPR surveys in 2012–14

**Christoph Mayer, Julia Jaenicke, Astrid Lambrecht, Ludwig Braun, Christof Völksen, Christian Minet, Ulrich Münzer**  
Local surface mass-balance reconstruction from a tephra layer – a case study on the northern slope of Mýrdalsjökull, Iceland

**Evan Miles, Ian Willis, Neil Arnold, Jakob Steiner, Francesca Pellicciotti**  
Spatial, seasonal and interannual variability of supraglacial ponds in the Langtang valley of Nepal, 1999–2013

**Roman Motyka, Ryan Cassotto, Martin Truffer, Kristian Kjeldsen, Dirk van As, Niels Korsgaard, Mark Fahnestock, Ian Howat, Peter Langen, John Mortensen, Kunuk Lennert, Søren Rysgaard**  
Asynchronous behavior of outlet glaciers feeding Godthåbsfjord (Nuup Kangerlua) and the triggering of Narsap Sermia's retreat in southwest Greenland

**Stefano Picotti, Roberto Francese, Massimo Giorgi, Franco Pettenati, José Carcione**  
Estimation of glacier thicknesses and basal properties using the horizontal-to-vertical component spectral ratio (HVSr) technique from passive seismic data

**Louis Sass, Michael Loso, Jason Geck, Evan Thoms, Daniel McGrath**  
Geometry, mass balance and thinning at Eklutna Glacier, Alaska: an altitude–massbalance feedback with implications for water resources

**Marius Schaefer, Jose Luis Rodriguez, Matthias Scheiter, Gino Casassa**  
Climate and surface mass balance of Mocho glacier, Chilean lake district, 40° S

**Emily Shroyer, Laurie Padman, Roger Samelson, Andreas Muenchow, Leigh Stearns**  
Seasonal control of Petermann Gletscher ice-shelf melt by the ocean’s response to sea-ice cover in Nares Strait

**S. McKenzie Skiles, Thomas Painter**  
Daily evolution in dust and black carbon content, snow grain size, and snow albedo during snowmelt, Rocky Mountains, Colorado, USA

**S. McKenzie Skiles, Thomas Painter, Gregory Okin**  
A method to retrieve the spectral complex refractive index and single scattering optical properties of dust deposited in mountain snow

**Donald Slater, Peter Nienow, Andrew Sole, Tom Cowton, Ruth Mottram, Peter Langen, Doug Mair**  
Spatially distributed runoff at the grounding line of a large Greenlandic tidewater glacier inferred from plume modelling

**Lide Tian, Yao TanDong, Yang Gao, Lonnie Thompson, Ellen Mosley-Thompson, Sher Muhammad, Jibiao Zong, Cheng Wang, Shengqiang Jin, Zhiguo Li**  
Two glaciers collapse in western Tibet

**Mareike Wiese, Martin Schneebeli**  
Snowbreeder 5: A Micro-CT device for measuring the snow-microstructure evolution under the simultaneous influence of a temperature gradient and compaction

**David Wilton, Amey Jowett, Edward Hanna, Grant Bigg, Michiel van den Broeke, Xavier Fettweis, Philippe Huybrecht**  
High resolution (1 km) positive degree-day modelling of Greenland Ice Sheet surface mass balance, 1870–2012 using reanalysis data

**Xiangke Xu, Baolin Pan, Guocheng Dong, Yi Chaolu, Neil Glasser**  
Last Glacial climate reconstruction by exploring glacier sensitivity to climate on southeastern slope of the western Nyaiqentanglha Shan, Tibetan Plateau

**Qinghua Ye, Jibiao Zong, Lide Tian, J. Graham Cogley, Chunqiao Song, Wanqin Guo**  
Glacier changes on the Tibetan Plateau derived from Landsat imagery: mid-1970s to 2000–13

**Yushan Zhou, Zhiwei Li, Jia Li**  
Slight glacier mass loss in the Karakoram region during the 1970s to 2000 revealed by KH-9 images and SRTM DEM



# Creative Commons licensing

A brief description of the various options

It has come to our notice that many of our authors are unaware of the extremely wide-ranging nature of the version of the CC-BY licence under which by default Cambridge University Press (CUP) publishes their work (CC-BY Attribution), and do not realize that there are different, more restrictive versions of the licence which are available to them instead on request. Under the CC-BY Attribution licence there is nothing to stop anyone in the world

from republishing your work in a different form and charging for it (for instance, in an anthology of papers on a theme) or even from making alterations to it and adding a different conclusion, provided that they somewhere acknowledge the source and mention that changes have been made.

Accordingly we thought it might be useful to republish the variations on the licence that you can request from CUP if you wish.

## CC-BY Attribution 4.0 (CUP's default)

- Readers are free to
  - Share – copy and redistribute the material in any medium or format
  - Adapt – remix, transform, and build upon the material

For any purpose, even commercially

- Under the following terms
  - Attribution – Reusers must give appropriate credit, provide a link to the licence and indicate if changes were made. They may do so in any reasonable manner, but not in any way that suggests the licensor endorses them or their use.

No additional restrictions – Reusers may not apply legal terms or technological measures that legally restrict others from doing anything the licence permits.

## CC-BY NC SA 4.0

- Readers are free to
  - Share – copy and redistribute the material in any medium or format
  - Adapt – remix, transform, and build upon the material
- Under the following terms
  - Attribution – Reusers must give appropriate credit, provide a link to the licence and indicate if changes were made. They may do so in any reasonable manner, but not in any way that suggests the licensor endorses them or their use.

- NonCommercial – Reusers may not use the material for commercial purposes.
- ShareAlike – If reusers remix, transform or build upon the material, they must distribute their contributions under the same licence as the original.

## CC-BY NC ND 4.0

- Readers are free to
  - Share – copy and redistribute the material in any medium or format
- Under the following terms
  - Attribution – Reusers must give appropriate credit, provide a link to the licence and indicate if changes were made. They may do so in any reasonable manner, but not in any way that suggests the licensor endorses them or their use.
  - NonCommercial – Reusers may not use the material for commercial purposes.
  - NoDerivatives – If reusers remix, transform or build upon the material, they are not permitted to distribute the modified material.

For further details please visit: <https://creativecommons.org/licenses/>



# Seaside glaciology in California

IGS Symposium La Jolla, California, USA, 10–15 July 2016

The International Symposium on Interaction of Glaciers and Ice Sheets with the Ocean was held in La Jolla, California, USA, 10–15 July 2016. This was the second time in 5 years that professor and glaciologist Helen Fricker and her team of merry colleagues have hosted a full IGS symposium on ice/ocean interaction at the Scripps Institution of Oceanography. The symposium venue features breathtaking views of the surf coming ashore from the Pacific Ocean, fresh ocean breeze, blue sky and comfortable temperatures. Although little ice is visible in Southern California's beach communities, the impact of ice on the ocean is always in mind, particularly for the local oceanographers who work at Scripps, one of the premier oceanographic institutions in the world.

Following the delightful icebreaker by the Scripps Pier held on Sunday night, the first oral sessions began on Monday with reports from several hard-charging field and remote-sensing projects on both the big and the small ice shelves of Antarctica. Kirsty Tinto gave the first talk about the NSF-funded ROSETTA-Ice mission that is re-surveying the Ross Ice Shelf using state of the art sensors aboard a large C-130 aircraft platform flying a tight set of survey lines. This was complemented by Peter Bromirski, a local Scripps seismologist, who gave a talk on the large-scale seismic array deployed on the Ross Ice Shelf to detect and understand the influence of ocean waves on the ice shelf. Olga Sergienko presented a model of flexural gravity waves on the ice shelf

to compliment these two data-producing studies.

The afternoon of the first day focused on new techniques for measuring, and results from measurement of sub-ice-shelf melting. Fernando Paolo, a recent graduate of Scripps Institution of Oceanography, reviewed what satellite laser altimetry says about ice-shelf thinning in the Amundsen Sea due to basal melting. This was followed by a presentation on sub-annual temporal variability of the Filchner–Ronne Ice Shelf's basal melting regime at several point locations. These two talks and those that were also given in this afternoon session, chaired by Fiamma Straneo and Kelly Brunt, highlighted the progress that has occurred in our understanding of sub-ice-shelf basal melting regimes since the last symposium on ice/ocean interaction 5 years ago in La Jolla.

Monday afternoon concluded with an Ignite Session and the first of two poster sessions. According to the Ignite instructions: *Enlighten us, but make it quick! Ignite presenters get 20 slides, which automatically advance every 15 seconds. The result is a fast and fun presentation that lasts just 5 minutes. Our theme for this year's IgniteIGS is Early career perspectives on the future of ice-ocean research. All our IgniteIGS presenters will have a poster in the poster session directly following their IgniteIGS talk. Six early career presenters gave Ignite talks, Liz Logan, Lynn Kaluzienski, Laura Lindzey, David Porter, Ronja Reese and James Jordan. What a whirlwind*



Few symposium locations have such a beautiful setting. Julie Palais captured the view over La Jolla bay on her walk down from the dorms in the morning.



The Icebreaker was as busy as always, and all the more enjoyable for being in the open air. Photo by Julie Palais.



Britney Schmidt and Kirsty Tinto catching up at the Icebreaker. Photo by Julie Palais.

set of talks they gave, but they were on top of their subject and on top of making a clear and enjoyable presentation.

For the two poster sessions, the moving walls of the seaside conference venue were opened to allow the sea breeze and sound of breaking surf to provide a background to the din of constant conversation among poster presenters and their roving audience. (See videos of the poster sessions on the IGS Facebook site.)

On Tuesday, the momentum of the symposium built on Monday was amplified, much like the curl of a perfect breaking wave. The day's talks featured continued looks into ice shelves, the perspectives of ocean observations surrounding ice sheets and glaciers and processes at grounding lines controlled by ocean effects. The highlight of Tuesday was an evening reception at the home, 'Seiche', of famed senior oceanographer Walter

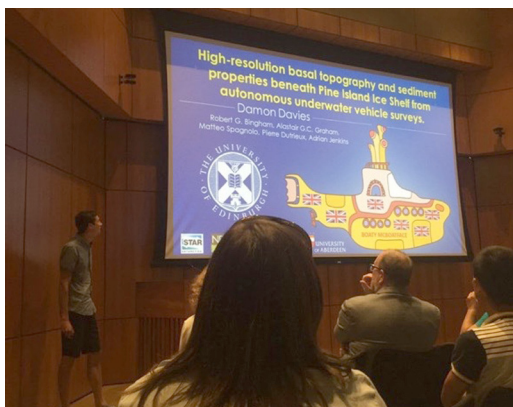


The audience was attentive ...



... and at break times they went outside and were equally attentive to the sun and the sea! Photos by Julie Palais.

Munk. Walter had suffered a minor accident earlier in the day, so only was able to attend the very end of the reception; but all symposium participants enjoyed his hospitality anyway, an excellent selection of food and drink and the joyous ambiance of his gardens and household.



Presentations on the first day included this one by Damon Davies.



The poster sessions were the scene of lively discussion and explanation. This is a still from a time-lapse video made by Doug MacAyeal, which can be accessed either by clicking on it [here](http://www.igsoc.org/hyperlink/ljposters.mp4) or at [www.igsoc.org/hyperlink/ljposters.mp4](http://www.igsoc.org/hyperlink/ljposters.mp4)





On Tuesday evening the entire symposium was once again invited to a reception at the beautiful home, 'Seiche', of renowned oceanographer Walter Munk. Everyone thoroughly enjoyed eating, drinking and socializing in Walter's spectacular garden. Photos by Julie Palais and Helen Fricker.



The reception provided an opportunity to celebrate the Secretary General's birthday. He was delighted to be 39 again.





Secretary General Magnús Már Magnússon thanks our generous host and presents him with an IGS dish.



And afterwards, a photo opportunity with symposium supreme Helen Fricker and her daughters Daisy (left) and Zoë.

Wednesday featured a morning of presentations on models and what models are saying about ocean/ice interaction. Following the end of the morning's sessions, the symposium took an afternoon recess to allow delegates to try their hand at surfing, sea kayaking, sight-seeing and otherwise being sunny and comfortable on the spectacular beach locations of La Jolla.

Refreshed from the outdoor activities of Wednesday afternoon, members of the symposium reconvened on Thursday to hear the latest research on tidewater glaciers and Greenland runoff and to attend the second of the two poster sessions of the week. Thursday concluded with a bus trip to downtown San Diego to board the *California Spirit*, a Flagship dinner cruise ship, which took the delegates out on San Diego Bay towards the Coronado Bridge for a delightful symposium banquet.



Setting off for the Thursday evening banquet. Again this is a still from Doug MacAyeal's time-lapse video at [www.igsoc.org/hyperlink/ljbanquet.mov](http://www.igsoc.org/hyperlink/ljbanquet.mov)

Friday brought the symposium's presentations to a conclusion with talks on sea ice, polynyas, ice mélange and paleoceanography. The symposium was thought by all attending to have been extremely enjoyable, not only because of the chance to see colleagues in a delightful venue, but also because the symposium made very clear the fast-paced advancements of the community's understanding of ice/ocean interaction.



Not quite your usual banqueting venue!



The occasion was much enjoyed by everyone.



And for the rest of the week participants went on listening to great talks, such as this Ignite presentation by Tasha Snow on 'Hacking the science funding crisis'

The success of the symposium, measured both in terms of its broad and deep intellectual content as well as in terms of the enjoyment the participants experienced in attending, was entirely due to the hard work of the local organizing committee led by Helen Fricker, Matt Siegfried, Anders Damsgaard, Donna Shabkie, Maya Becker, Fernando Paolo, Wesley Neely and Susheel Adusumilli.

*Well the Swiss glaciers are well studied  
Knowing all the papers is hard to try  
And Italian glaciers, with all the water they make  
They quench my thirst when I'm a bit dry*

*The Canadian west coast glaciers  
Really make you see the light  
And the Nordic ice with its hydroelectric dams  
Can help you read the Journal at night*

*Patagonian snow has its sunshine  
And the penitentes make a jagged wall  
I dig a Nepalese debris cover on those bits of ice  
By a mountain that's way too tall*

*The Tibetan glaciers worry  
That the air is a bit too thin,  
And the New Zealand ice is very nice  
But it's down South without any kin*

*Central Asia has the ice that counts  
From number 1 to number 9  
The tropics have their El-Nino-fed snow  
That is grander than what I know*



... and enjoying the coffee breaks!

*I've been around this great big world  
And met glaciologists who are so nice  
Yeah, but I couldn't wait to get back to the 'States  
To the meeting on interactions of ocean and ice.*

*I wish they all could be California  
I wish they all could be California  
I wish they all could be California symposia!*

**Doug MacAyeal**



Thanks to Julie Palais (and Ute Herzfeld) for ICE's first ever symposium selfie! It's obvious that you were enjoying yourselves!



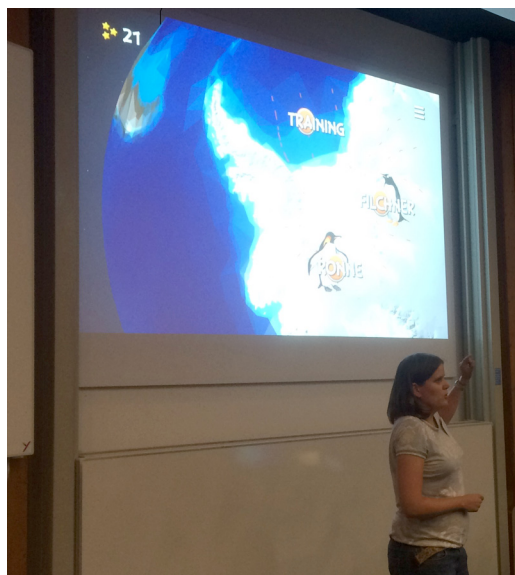


# British Branch Meeting 2016

University of Southampton, Southampton, UK, 7–8 September 2016

The 2016 meeting of the British Branch of the International Glaciological Society took place from 7–8 September at the University of Southampton on the south coast of England. Jane Hart welcomed the delegates and the conference launched straight into the first of the four oral sessions.

In the first session Hamish Pritchard explained why Asia's glaciers matter, Charlie Bunce compared the dynamic response of outlet glaciers in north west and south east Greenland, Ádám Ignéczi looked at the expansion of Greenland's supraglacial lakes in the current century and William Harcourt investigated glacier acceleration in the Canadian High Arctic using feature-tracking methods. In the afternoon the second oral session saw presentations from Liz Bagshaw, who presented proof-of-concept tests on the use of wireless sensors to investigate processes in firn in East Greenland; Andy Hodson, who examined the role of meltwater runoff in marine ecosystems off the Antarctic Peninsula; Nick Rutter, who used ice penetrating radar to investigate the properties of internal snowpack layer boundaries; and Anne Le Brocq, who demonstrated the excellent educational online game, Ice Flows.



Anne Le Brocq invites us to pick a penguin in the educational online game Ice Flows.

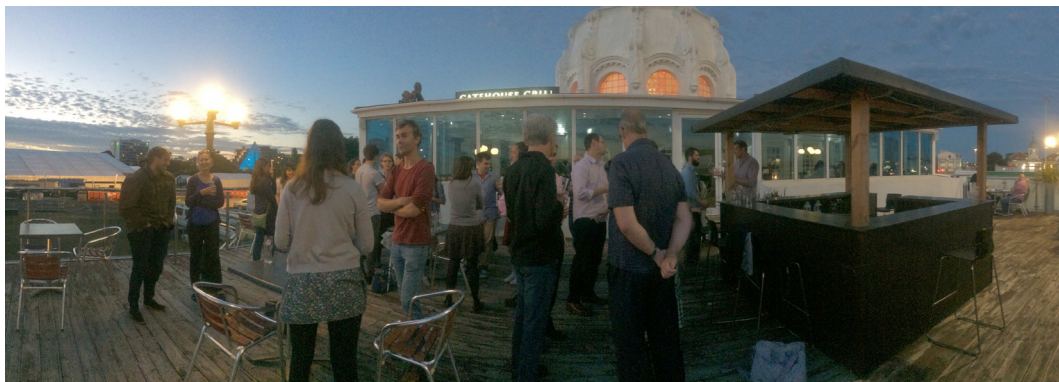
Attention moved on to the variety of interesting posters on display, with their authors giving brief introductions ahead of the poster session itself. The poster session was followed by Liz Morris's presentation on modelling snow densification at Pine Island Glacier, in celebration of her Richardson Medal. The academic part of day 1 ended with a presentation from Martin Siegert on subglacial lakes beneath Institute Ice Stream.

In the early evening Jane Hart led a guided walk from the historic Bargate around the city walls to the splendid venue for the conference dinner, the Royal Thai Pier, where Liz Morris was awarded her Richardson Medal (featured in the last issue of ICE). The fabulous meal was preceded by a drinks reception on the terrace, making the most of the pleasant view over the marina and the setting sun.

Two further oral presentation sessions took place on the second day. In the first part of



Conference delegates begin a guided walk with Jane Hart around historic Southampton at the Bargate.



Conference reception at the Royal Thai Pier.

session 3 we heard presentations from Brent Minchew on glacier response to ice-shelf thinning in West Antarctica, Amber Leeson on the regional climate of the Larsen B embayment and Robert Arthern on melting beneath 21st-century ice shelves and sea-level contribution from the West Antarctic Ice Sheet. After the coffee break Teresa Kyrke-Smith presented a new Stokes inversion model applied to Pine Island Glacier, Hilmar Gudmundsson examined velocity changes on the Brunt Ice Shelf using observations and modelling, and Geoffrey Evatt spoke about the lost meteorites

of Antarctica. This was followed by the British Branch AGM, including discussion of where future IGSBB meetings will take place, and lunch, which was in the university's Hartley Suite, as on day 1.

The final oral session took place in the afternoon. David Sugden examined the age of the glacial trimline in the Ellsworth Mountains, Helena Sykes gave an overview of how the glaciological community can benefit from the Copernicus Programme for Earth Observation and Jane Hart investigated subglacial behaviour in the deforming bed using wireless probes.

Following a highly interesting two days of presentations, the John Glen student prizes were awarded by David Sugden and Liz Morris. This year's worthy winners were Charlie Bunce (Newcastle University) for her oral presentation on the dynamic response of marine-terminating outlet glaciers in Greenland and Markus Todt (Northumbria University) for his poster on improving the simulation of longwave enhancement beneath boreal forest canopies in snow and land models. In traditional British fashion, the conference was rounded off with tea, coffee and cakes.

Many thanks to everyone who attended – we hope you enjoyed it. On to Lancaster for 2017! #IGSBB



John Glen prize winners Markus Todt (poster) and Charlie Bunce (oral presentation) with David Sugden and Liz Morris.

**Helena Sykes**

## Report from the Fourth International Summer School in Glaciology

McCarthy, Alaska, USA, 7–17 June 2016

Early in the morning of 7 June 2016, we, 28 graduate students from ten different countries (most from the USA and Canada, but others travelling from Bolivia, Germany, Switzerland, England, Norway, India, Nepal and Australia) started our journey from Fairbanks (Alaska) to McCarthy, for the fourth International Summer School in Glaciology. The International Summer School in Glaciology is an intense 11-day glaciology course hosted by the University of Alaska Fairbanks (UAF), providing graduate students with a 'comprehensive overview of the physics of glaciers and current research frontiers in glaciology' through formal lectures, exercises and group projects. Joining us as course instructors were Regine Hock (UAF, summer school coordinator), Andy Aschwanden (UAF), Ed Bueler (UAF), Gwenn Flowers (SFU, Canada), Leigh Stearns (Kansas University), Martin Truffer (UAF) and Mike Loso (Alaska Pacific University Anchorage), all prominent researchers in their field.

After a bumpy 11 hour journey through the scenic mountains of southern Alaska, we arrived in the small town McCarthy. McCarthy, a holdover from the copper boom of the early 20th century, is surrounded by the largest National Park in the USA, Wrangell–St. Elias National Park, and is within walking distance of the Kennicott glacier, which makes it the ideal location for this glaciology course. We spent our days at the Wrangell Mountains Center (WMC) which is a non-profit institution open to all and dedicated

to the exploration, and appreciation of wildlands and mountain culture in Alaska and beyond. The WMC not only served as our classroom, research center, and social club, but also as our mess hall providing three delicious meals a day, all prepared with freshly harvested garden ingredients. We spent our nights in our colorful tent-city, set up in a wide grassland area only a few walking minutes away from the WMC.

Each morning consisted of 4 hours of lecture covering a variety of glaciological topics, ranging from the theory of continuum mechanics, glacier mass balance, ice flow dynamics and glacier hydrology to remote sensing techniques and ice sheet modeling. The lectures were held in a log cabin called the 'Porphyry Place'. This added a special ambience to each lecture as the 'Porphyry Place' is the former home of Edward LaChapelle, a pioneer in the field of avalanche research and forecasting as well as a glaciologist, mountaineer, skier and author. During our first afternoon, we covered the walls of the WMC with the research posters that each student was asked to prepare in advance of the course. This student poster session lasted the entire afternoon where we had the opportunity to communicate our own research ideas and learn about the research projects of others, while also receiving valuable feedback and suggestions from students and instructors. The remaining afternoons were dedicated to reinforcing our understanding of the theory presented during



Students working on hands-on exercises in the front yard of the Wrangell Mountains Center. Photo: Regine Hock.



Students setting up their research posters for the afternoon-long poster session to discuss our MSc and PhD research projects. Photo: Regine Hock.





Gwenn Flowers, Jessica Zimmermann Mejia, Christina Carr, John Cavanagh and Dustin Carroll working on their student project. Photo: Regine Hock.



Mike Loso giving some glacier-travelling safety instructions before crossing Root glacier. Photo: Regine Hock.

the morning lectures through 2 hour long hands-on exercises. The rest of the afternoon, we would then spend working on group projects. The group projects were mini research projects assigned to groups of two or three students, each designed and supervised by one of the course instructors. The projects covered a large variety of topics including analyzing the use of GPS data to derive ice flow velocities, evaluating glacier surges in space and time, modeling the glacier surface energy balance and the subglacial drainage, or

analyzing inverse models to determine subglacial bedrock properties. For most students, their group project topic was different from their graduate research, which challenged us to broaden our horizons and develop new skills in different areas of glaciology. At the end of the week, each group presented their project results in a miniature conference, which was a great opportunity to practice our presentation skills. It was impressive to see how much we had achieved in such a short period of time!

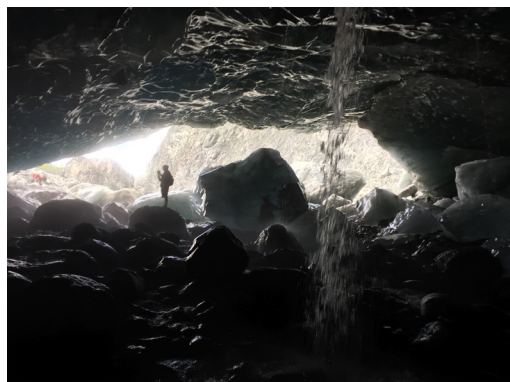


Group picture of the students and instructors from the fourth International Summer School in Glaciology during the excursion on the Root glacier. Photo: Andy Aschwanden.

A highlight of the course was the one-day excursion onto the Kennicott/Root glacier, led by Mike Loso. We started with a short hike from the former mining village of Kennicott to the Root glacier. We then traversed across Root glacier, which merges with the debris-covered Kennicott glacier. On the glacier we admired the beauty of various glacial features such as meltwater channels, medial moraines, moulins, and sediment covered ice structures that marked the position of former moulins. At the western margin of the Root glacier, near Donahoe Falls, there is a lake that forms annually and is dammed by the glacier. This year, the lake had already drained prior to our arrival, which allowed us to explore the impressive ice cave that had been formed by water cutting underneath the glacier. A separate half-day excursion was also organized to the front of the Kennicott glacier. There, students saw a recently-formed proglacial lake, learned about the regional geomorphology of the area and saw lateral moraines as well as overridden tree trunks remaining from the advance of the glacier during the Little Ice Age. Every student thoroughly enjoyed these excursions outside the classroom to experience the beauty of the glaciers near McCarthy for themselves. For some students, the excursion onto the Root glacier was their first experience walking on a glacier and is therefore something they will never forget!

A special 2 hour portion of the course was set aside for a workshop on Engaged Scholarship led by Lizz Utlea, a fellow classmate and PhD student from the University of Michigan. Lizz is deeply interested in ethics, diversity of knowledge and community service and has long been involved in volunteering and NGO administration related to intercultural education and exchange. Lizz's session comprised an interactive workshop that guided students through discussions about our individual goals in research, involvement in community outreach and politics. In the end, we learned about how to get involved and share our research in an accessible and engaging way, certainly an important skill for our future careers as scientists.

On three of our evenings, we re-grouped after dinner for a guest lecture. Mark Vail, a long-time resident of McCarthy gave a guest lecture entitled 'A View from Here' on one of our first evenings. Mark shared with us his knowledge of the fascinating history of McCarthy, Kennicott and the mining industry, as well as former glacier states, yearly flood events and how each year the bridges needed to be rebuilt after the flooding. On another evening, we enjoyed a guest lecture from Vladimir Alexeev (UAF) about recent changes in the Arctic climate and associated changes in sea



Student exploring the ice cave beneath Root glacier. Photo: Regine Hock.

ice. For a final lecture, everyone from McCarthy was invited to attend a public lecture on tidewater glaciers by Martin Truffer. Besides the scientific facts about tidewater glaciers and their behavior under recent climatic changes, we all enjoyed the stunning videos and impressive pictures from tidewater glaciers that Martin showed.

On other evenings, we would either gather around a bonfire in tent-city, play in the weekly Friday night softball game organized by McCarthy's residents, or attend the open mic night at 'The Golden Saloon', where the bravest of us would dare to sing a song. And of course, one night we ran the traditional glaciology summer school soccer game, in which the American students and instructors played against those of us from the rest of the world. The 'rest of the world' team clearly won; however, our strategy of loudly cheering and applauding at every near goal until everyone agreed that it indeed went in might have helped with the win. On our last evening together, we celebrated the success of the course during a fun banquet dinner in the dining room of 'The Golden Saloon'. After the delicious pork dinner, the pictures and videos taken during the week and entered in this year's photo/video contest were shown. The winners of the contest were chosen by the highly scientific applause-o-meter, and were awarded with hats and T-shirts generously sponsored by IGS.

After a short night and quick pack in the morning, we began our long and bumpy journey back to Fairbanks. There, Regine Hock invited us all for pizza at her home before we made our separate ways back to our universities across the globe. Our 11-day summer school successfully brought together a diverse group of graduate students and instructors, where we were trained in glaciology through lectures, exercises and group work in a beautiful and intimate setting. We



left as a new generation of glaciologists armed not only with a better understanding of the ice bodies we study, but also with new connections and friendships to fellow scientists across the globe!

The International Summer School in Glaciology received generous support from NASA, the Glaciology Exchange program (GlacioEx) funded by SIU (Norwegian Center for International Cooperation in Education) the International Glaciological Society (IGS), the International Association of Cryospheric Sciences (IACS), the International Union of Geodesy and Geophysics (IUGG), and the Geophysical Institute, University of Alaska Fairbanks.

We thank these organizations for their support and we thank the course instructors for dedicating their time and experience to teaching and supporting us for those 11 days! We hope that the International Summer School in Glaciology will take place for many more years so that future students have the same opportunity to learn from and interact with experienced and world-renown glaciologists in such an ideal setting.

**Anja Rutishauser**  
University of Alberta

## Presentation of Honorary Membership to Professor Keiji Higuchi

On 30 November 2016, Honorary Membership of the International Glaciological Society was awarded to Professor Keiji Higuchi on the occasion of the 7th Symposium on Polar Science held in the National Institute of Polar Research in Tokyo. The certificate was presented by Professor Atsumu Ohmura, a former president of the IGS, following a memorial lecture Professor Higuchi gave on his research activity in the Arctic on T3.



Above: Professor Higuchi delivering his memorial lecture. Left: Professor Ohmura (right) presents Professor Higuchi with his certificate of Honorary Membership (pictured below).





## New office for the IGS

Following the move of our journal production to Cambridge University Press in January 2016 and the resulting staff restructuring, the IGS was left with an office that was too large for our needs. During the Cambridge symposium in 2015, when we worked with staff from the British Antarctic Survey (BAS) we discovered that as part of their Aurora Innovation Centre development (<https://www.bas.ac.uk/science/science-and-innovation/aurora-cambridge/>) they were looking to expand their portfolio of tenants within the BAS building. The BAS facility is located just to the west of Cambridge in an area where the University of Cambridge and the City of Cambridge are rapidly building new commercial, residential and university facilities.

We approached BAS to see if they had space for us in their building and were glad to discover that they could offer us a 25<sup>m</sup>² first-floor office. In September 2016 Magnús and I moved in. This involved quite a bit of clearing out, many trips to the local recycling centre and charity shop and some strong removers on moving day itself! We are now quite settled in the new space and are enjoying having a larger community of glaciologists and researchers around. There is also the added benefit of reduced office



The office has enough space for Magnús, Louise, the computers, the archives, the files and most of the pictures.

expenses and the proximity of a very good and subsidised staff canteen! We look forward to welcoming you to our new office if you ever find yourself in Cambridge. Our postal address is now High Cross, Madingley Road, Cambridge, CB3 0ET, UK. All other details remain the same.

**Louise Buckingham**



Nevertheless, there was 40 years of clearing out, mainly of paper archives, to be done before the move. The Secretary General was in his element.



INTERNATIONAL GLACIOLOGICAL SOCIETY

International Symposium on  
**Polar Ice, Polar Climate, Polar Change**  
Remote sensing and modeling advances in understanding the cryosphere



University Memorial Center, University of Colorado Boulder,  
Boulder, Colorado, USA, 14–19 August 2017

*Co-sponsored by:*

- ❄ National Snow and Ice Data Center
- ❄ Cooperative Institute for Research in Environmental Sciences
- ❄ Institute of Arctic and Alpine Research
- ❄ National Center for Atmospheric Research
- ❄ University Corporation for Atmospheric Research

SECOND CIRCULAR

March 2017

<http://www.igsoc.org/symposia/>



The International Glaciological Society will hold an International Symposium on 'Polar Ice, Polar Climate, Polar Change' at the University of Colorado in Boulder on 14–19 August 2017. The meeting will take place at the University Memorial Center's Glenn Miller Ballroom.

Please note that, as a break with tradition to accommodate the post-symposium tour to view the solar eclipse, the symposium will begin on Monday afternoon; talks will commence on Tuesday and continue until Saturday afternoon.

#### THEMES

The changes of the past 15 years in Arctic and Antarctic sea ice and the ice sheets appear to be a prelude to new levels of impact of the polar regions on global climate and sea level. The first-year ice system is expanding in the Arctic, with processes comparable to those of Antarctic sea ice. Antarctic sea-ice extent is highly variable and is responding to shifts in ocean circulation and wind patterns. Both polar sea-ice systems interact in important ways with climate and with the adjacent ice sheets.

Much of the growing awareness and understanding of polar change has come from the tremendous success of satellite and airborne remote sensing, supporting both process studies and modeling of the geophysical basis for observed changes. The proposed symposium will both summarize new, high-profile results from the international research communities and provide a synthesis of current understanding as climate change impacts continue.



University of Colorado  
Boulder





The goals of this symposium are:

- (1) to provide a forum for presenting the current best observational data of all aspects of sea ice and polar ice sheets in both hemispheres, and their ongoing changes
- (2) to present and discuss results from models of ongoing polar climate and cryospheric processes, and interactions between sea ice and the climate system
- (3) to examine the likely future course of the sea-ice, ice-sheet and polar-climate systems as revealed by coupled models
- (4) to entrain the global polar science community, at all stages of career development, in discussing the state and direction of the Earth's polar regions.

#### TOPICS

We welcome all submissions for presentations under the broad topics of polar remote sensing and polar cryospheric and climate-system modeling. The key focus areas include (but are not limited to):

1. **Sea-ice mapping and observations** of sea-ice–climate–ocean processes and interactions; remote determination of snow cover on sea ice or sea-ice thickness; sea-ice models; past, present and future evolution of the Arctic or Antarctic sea-ice system; studies combining field and remote observations







2. **Satellite or airborne observations of ice-sheet and glacier mass balance**, glacier flow, ice-sheet accumulation, surface melting, melt ponds and streams; remote sensing of ice–ocean interaction and ocean circulation near the ice front; new observational techniques; historical records of ice flow and thickness
3. **Model studies of polar regions**, including: ice-sheet and ice–ocean processes; polar climate variability; coupled models of the polar atmosphere–ice–ocean–land system; predictive models of the evolution of the ice-sheet system, ice–ocean system, or terrestrial snow cover over the next few decades to centuries
4. **Trends in snow cover over the Northern Hemisphere**; snow albedo, dust and soot in snow; new technologies for mapping snow cover; remote sensing (satellite and airborne) studies of permafrost, new methods of observation of permafrost
5. **Calibration and validation studies** of polar remote-sensing data
6. **Information** on the polar cryosphere, especially sea ice extents, **from early satellite or other remote-sensing records**; data rescue
7. **Data management and informatics** as they apply to polar remote-sensing data, calibration–validation data sets.





## REGISTRATION FEES

All fees are in US Dollars

Early registration until 15 May 2017

– Participant (IGS member):	\$625
– Participant (not IGS member):	\$725
– Student or retired (IGS member):	\$475
– Student or retired (not IGS member):	\$540
– Accompanying person (21+):	\$275
– Accompanying person (12–20):	\$200
– Accompanying person (<12):	Free
– Delegate registration after 14 May 2017:	add \$50
– Delegate registration after 23 July 2017:	add further \$100

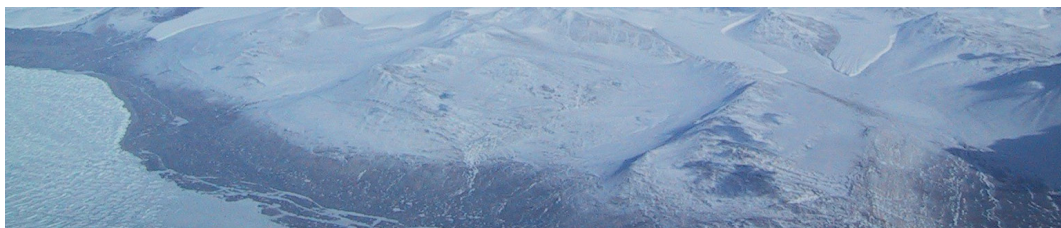
All prices will be charged in UK£ equivalent at the exchange rate valid near the date of transaction.

**The fees include the Icebreaker, lunches Tuesday through Saturday, the Symposium Banquet (including some wine and beer) and daily morning/afternoon refreshments.** Please register for the symposium through the IGS website. If you cannot do this, contact the IGS office directly at [igsoc@igsoc.org](mailto:igsoc@igsoc.org). If payment by credit card is not possible, contact the IGS office to arrange for a bank transfer.

Please check whether you will require a visa to enter the USA. If you need an invitation letter, please contact the IGS office at [igsoc@igsoc.org](mailto:igsoc@igsoc.org). The sooner you do this the more likely it is that your visa will be processed in time.

## ACCOMPANYING PERSONS

The accompanying person's registration fee includes the Icebreaker, the Wednesday afternoon field trip and the Symposium Banquet. **It does not include attendance at the presentation sessions.**





#### ABSTRACT AND PAPER PUBLICATION

Participants wishing to present a paper (either oral or poster) at the Symposium must submit an abstract by Monday 17 April 2017. Abstracts need to be submitted via the IGS website. A collection of submitted abstracts will be provided for all participants at the Symposium.

The Council of the International Glaciological Society has decided to publish a thematic issue of the *Annals of Glaciology* on topics consistent with the Symposium themes. Submissions to this issue will not be contingent on presentation at the Symposium, and material presented at the symposium is not necessarily affirmed as being suitable for consideration for this issue of the *Annals*. Participants are encouraged, however, to submit manuscripts for this *Annals* volume. The deadline for submission of *Annals* papers is 30 June 2017.

#### PROGRAM

A mixture of oral and poster sessions, interlaced with ample free time, forms the general framework of the symposium, which is intended to facilitate exchange of scientific information between participants in an informal manner. Additional activities include an opening Icebreaker, a symposium banquet and a selection of activities during a Wednesday (16 August) afternoon mid-symposium break. There is a post-symposium geology and landscape excursion planned, and a post-symposium excursion to the path of a solar eclipse on Monday 21 August.







## VENUE

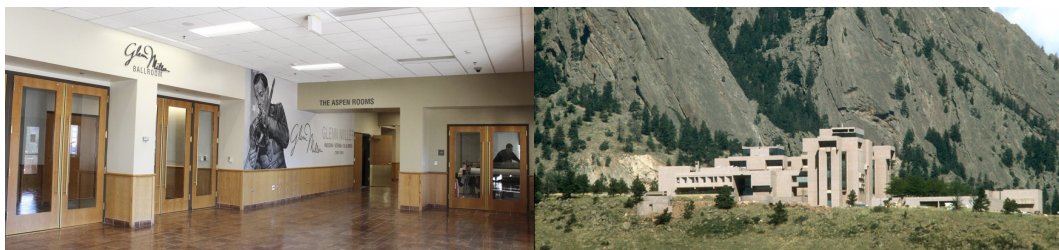
The symposium will be held at the University Memorial Center's Glenn Miller Ballroom, located near the center of the University of Colorado's Boulder Campus, with dining facilities just a short walk away and a large patio area with a view of the famous Flatiron mountain ridge. A number of hotels are within reasonable walking distance, and Boulder has an excellent bus system and bike path network for getting around. Rent bikes through B-cycle: <https://boulder.bcycle.com>.

## LOCATION

Late summer in the Colorado Rockies is spectacular, with reliably warm, generally dry weather, magnificent mountains, awe-inspiring evening thunderstorms and excellent hiking and climbing possibilities. Boulder is a city of about 100 000 people, renowned for its restaurants, walking mall and biking- and walking-friendly layout, and its beautiful University campus. Nearby is Denver, a city of 2 million inhabitants, with sports, museums and other points of interest. Boulder is about a 90-minutes drive from Rocky Mountain National Park, or 45 minutes from trails that lead to the Continental Divide in the Indian Peaks Wilderness. Microbreweries abound in the Boulder area.

## ACCOMMODATION

A number of hotels have provided group rates for our conference. You must contact these hotels and make the bookings yourself. To book and guarantee your room, please provide them with your credit card details **at least 45 days prior to arrival**. Use *IGS/International Glaciological Society* to secure the group rate. All hotels listed below are located within walking distance of the conference venue. However, August is peak tourist season and the students are returning to CU for Fall Semester.







We recommend that you book as early as possible. The following hotels have the following group rates for IGS/International Glaciological Society for 14 August arrival through 22 August departure. Please note that rates may vary depending on property and the specific dates requested.

- **Millennium Harvest House**, 1325 28th Street, Boulder (2km to University Memorial Center). \$132/142 per night + tax single/double Standard; \$162/172 per night + tax single/double Superior room. Breakfast included. Free Internet. Free parking. One-night deposit required, at least 24-hour cancellation required for refund. Phone +1 303 443 3850; Email: [boulder@millenniumhotels.com](mailto:boulder@millenniumhotels.com); Website: <https://www.millenniumhotels.com/en/boulder/millennium-harvest-house-boulder/> Reservation URL will be posted on symposium website.
- **Best Western Plus Boulder Inn**, 770 28th Street, Boulder (2km to University Memorial Center). \$179/night + tax single/double King room through 19 August. Higher rate of \$234/night + tax single/double King room applies for 20 or 21 August stay on a space available basis. Breakfast included. Free Internet. Free Parking. Phone +1 303 449 3800 or +1 800 233 8469; Email: [boulderinnplus@gmail.com](mailto:boulderinnplus@gmail.com); Website: <http://boulderinn.com/> Reservation URL will be posted on symposium website.
- **Basecamp Hotel Boulder**, 2020 Arapahoe Avenue, Boulder (3km to University Memorial Center). \$139/night + tax single/double. Breakfast additional. Free Internet. Free parking. Phone +1 303 449 7550; Email: [frontdesk@basecampboulder.com](mailto:frontdesk@basecampboulder.com); Website: <http://www.basecampboulder.com/>





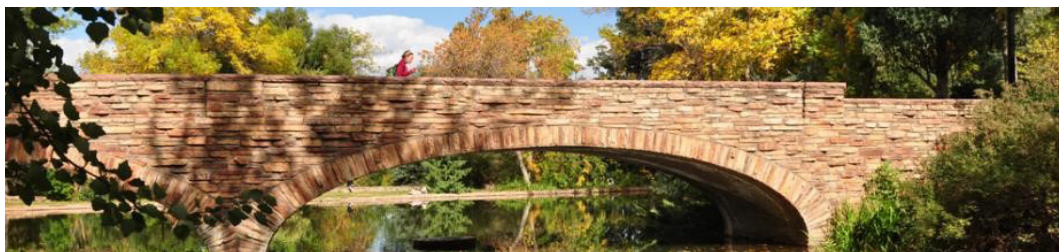
- **Courtyard by Marriott**, 4710 Pearl East Circle, Boulder (5km to University Memorial Center, good bike or walking via Boulder Creek Path). \$209/night + tax single/double. Breakfast additional. Free Internet. Free Parking. Phone +1 303 440 4700; Website: <http://www.marriott.com/hotels/travel/denbd-courtyard-boulder/>
- **Residence Inn by Marriott**, 3030 Center Green Drive, Boulder (6km to University Memorial Center). \$276/night + tax single. Breakfast included. Free internet. Free parking. Phone +1 800 331 3131; Website: <http://www.marriott.com/hotels/travel/vbocg-residence-inn-boulder/>  
Reservation link: <http://ow.ly/M0WQ309TmGC>

#### ICEBREAKER

The Icebreaker will be held on Monday 14 August, 4pm to 8pm at the Millennium Harvest House Hotel just south of Arapaho Road on 28th Street in Boulder. We will meet outdoors behind the hotel at their outdoor Pavilion, adjacent to Boulder Creek and the Boulder Creek Path (a paved sidewalk and bike path, and an excellent way to get around Boulder). Refreshments (cash bar) and finger food will be available from 5pm to 7pm. Delegates can also use this opportunity to complete their registration and collect their conference materials.







### BANQUET

The banquet will be held at the National Center for Atmospheric Research (NCAR) Mesa Lab on the evening of Thursday 17 August from 6pm to 9pm. Buses will depart the meeting venue at 5:30. The banquet will include appetizers and a buffet. Beer and wine will be served in moderation and service will require a valid government-issued ID. As per the laws of the State of Colorado and the policies of the University of Colorado Boulder, all registrants should hereby be aware that some portion of the registration fee will be used to purchase alcoholic beverages.

### MID-CONFERENCE EXCURSION

Brewery Tour, included in registration fee, pre-registration required  
Organizer: Allen Pope ([allen.pope@nsidc.org](mailto:allen.pope@nsidc.org))

We will have a tour of a local brewery and/or a microdistillery, time and weather permitting, in the Boulder County area, departing after the sessions at 3:15pm. A Buff Bus will depart from the meeting venue for the brewery/distillery tour at 3:15pm and return to the meeting venue at about 7pm.

For those who do not wish to join the tour, an unguided shopping and sightseeing shuttle to Pearl Street (downtown Boulder) will also run from the meeting venue every 30 minutes beginning at 3:30pm, with the last shuttle leaving downtown at 6:30pm.





POST-CONFERENCE FIELD TRIP 1, Sunday 20 August  
Geology tour of the Front Range, separate fee \$50  
Organizer: Tad Pfeffer (pfeffer@colorado.edu)

A one-day field trip touring the geology and landforms of the Front Range and eastern Rockies is planned. The trip will begin from the meeting venue at 9 am and will visit sites near Golden, Central City, Idaho Springs, Nederland, and down Boulder Creek Canyon returning to the meeting venue by 5pm. Basic box lunch and beverage is included.

POST-CONFERENCE FIELD TRIP 2, Monday 21 August  
Solar eclipse viewing, separate fee \$125  
Organizer: Terry Haran (tharan@nsidc.org)

A one-day bus excursion is planned to Alliance, Nebraska, to observe the total solar eclipse transiting the United States on that day. We will depart from the meeting venue at 5:30 am (we will not wait!) and travel to the viewing site, aiming to arrive at 10:00 am. The total eclipse period begins at 11:45 am and will last for 2' 30". A number of telescopes will be available for safe viewing of the event. We will plan to return to the meeting venue by 6pm that evening. Snacks, beverages and sandwiches will be provided.

#### CONTACTS

Magnús Már Magnússon, Secretary General, International Glaciological Society (IGS); Ted Scambos, Lead Scientist, National Snow and Ice Data Center (NSIDC); Tad Pfeffer, Institute for Arctic and Alpine Research (INSTAAR); Marika Holland, National Center for Atmospheric Research





## SYMPOSIUM ORGANIZATION

Magnús Már Magnússon (International Glaciological Society)

## SCIENCE STEERING AND EDITORIAL COMMITTEE

Mark Serreze, University of Colorado Boulder (chair), Ted Scambos,  
Allen Pope, Sharon Stammerjohn, Walt Meier, Marika Holland,  
Anna Hogg, Julianne Stroeve, Brent Minchew, Martin Sharp, Dirk van As

## LOCAL ORGANIZING COMMITTEE

Ted Scambos, Tad Pfeffer, Terry Haran, Marika Holland, Virginia Schultz,  
Linda Pendergrass, Betsy Sheffield, Allen Pope

Information will be updated on the conference website,  
<http://www.igsoc.org/symposia/2017/boulder/> as it becomes available.

## IMPORTANT DATES

*Polar Ice, Polar Climate, Polar Change*

Opening of online abstract submission:	7 March 2017
Opening of online registration:	15 April 2017
Abstract submission deadline:	17 April 2017
Notification of abstract acceptance:	24 April 2017
Early registration deadline:	15 May 2017
Deadline for full refund:	1 July 2017
Deadline for refund on a sliding scale:	24 July 2017
Late registration surcharge:	24 July 2017
Symposium starts:	14 August 2017

*Annals of Glaciology volume 59, issue 75*

Paper submission deadline:	30 June 2017
Final revised papers deadline:	2 October 2017



INTERNATIONAL GLACIOLOGICAL SOCIETY

## International Symposium on Cryosphere and Biosphere



Kyoto Prefectural University  
Kyoto, Japan  
14–19 March 2018

*Co-sponsored by:*

- ❄ Japanese Society of Snow and Ice (JSSI)
- ❄ Japan Consortium for Arctic Environmental Research (JCAR)

FIRST CIRCULAR  
November 2016

<http://www.igsoc.org/symposia/2018/kyoto>



The International Glaciological Society will hold an International Symposium on 'Cryosphere and Biosphere' in 2018. The symposium will be held at the heart of Kyoto, former imperial capital of Japan, from 14–19 March 2018.

## THEME

The cryosphere is now acknowledged as a unique biome that, in spite of the cold and harsh conditions, is inhabited by a diverse range of micro- and macroorganisms. Since the organisms play important roles in the cycling of carbon, nutrients and other elements within and around the cryosphere, these processes have received significant research attention from biogeochemists and microbiologists. However, the presence and activity of microorganisms within the cryosphere also demands attention from glaciologists with interests in the physical and chemical properties of snow or ice. This is because melting and the crystallization of snow and ice are enhanced or even induced by the presence and activity of organisms. For example, supraglacial microbes can darken and increase melting on glaciers and ice sheets, while some species of bacteria can act as ice nucleators. Their influence upon the chemistry of ice and ice crystal interstices also has relevance to the interpretation of ice cores. However, biological processes on, within and under the ice are still insufficiently understood for us to incorporate their direct and indirect effects into current models of the Earth system. Furthermore, most organisms in the cryosphere are physiologically adapted to low temperatures and an improved understanding of these mechanisms has great potential for application to agriculture, food science, medical and material engineering. This symposium will therefore provide an opportunity for glaciologists and biologists to meet and discuss the various phenomena associated with life in the cold. The goals of this symposium are: (1) to provide a forum for presenting the current knowledge of life and ecosystems in the cryosphere; (2) to discuss the important gaps in our understanding of interactions between biological activity and physical/chemical phenomena in the cryosphere, from molecular to system level; and (3) to encourage participants to form a new scientific community, discussing the state and direction of glacial biology or bio-glaciology.

## SUGGESTED TOPICS

We welcome all submissions for presentation under the broad topics of glaciology in the biosphere and/or biology in the cryosphere. The key focus areas are:

1. **Microbes and biogeochemistry in glaciers and ice sheets**, including algae and bacteria in supra-, en- and subglacial environments; darkening and melt enhancement of glaciers by biogenic impurities; biogeochemistry in subglacial aquatic environments; the nutrient cycle in glaciers; biogeography of glacial microbes; microbes on seasonal snow and lake ice
2. **The role of sea ice, icebergs and glacier calving fronts in marine ecosystems**, including the effects of sea ice and glacial melt water on marine biota; glacier fjord ecosystems; ecology of ice algae; changing polar marine ecosystems in global warming

3. **Permafrost and terrestrial biota**, including the ecology of tundra and forest in polar and alpine regions; vegetation and soil microbes in permafrost; the ecological succession of glacier forefields; microbes in seasonal snow and lake ice; the carbon cycle of the permafrost region
4. **Interaction between snow cover and forest**: snow cover in forested regions; forest ecology in snow-covered regions; living snow fences; avalanche protection forests
5. **Cryosphere ecosystems and climate change**: modelling of ecosystems across different time scales, including glacial–interglacial cycles and Snowball Earth events; projection of polar and alpine ecosystems in future global warming scenarios
6. **Biological ice nucleation**, including ecology of ice nucleation bacteria; global and local impact of biological ice nucleation; dynamics of bio-aerosol; ice crystallization or ice segregation in plant and fungi; ice nucleation activity in vertebrates and invertebrates
7. **Biomarkers and biogeochemistry in ice cores and frozen ground**, including analysis of microbes, pollen grains and other organic substances as a proxy of past environments; modifications of chemical compositions of soluble ions and air in ice by microbial activity; analytical technology of DNA and other biogenic substances for ice core study
8. **Physiology of cold adaptation and applications of biogenic material to low temperature technology**, including adaptation of organisms to low-temperature environments at the whole-organism, system or molecular level; anti-freeze and/or ice-binding proteins; cryopreservation of organisms; applications to food processing
9. **Emerging areas of cryosphere/biosphere research**

## PROGRAMME

A mixture of oral and poster sessions, interlaced with ample free time, forms the general framework of the symposium, which is intended to facilitate exchange of scientific information between participants in an informal manner. Additional activities include the customary icebreaker, a symposium banquet and a selection of activities for the Saturday afternoon mid-symposium break.

## ABSTRACT AND PAPER PUBLICATION

Participants wishing to present a paper (either oral or poster) at the Symposium will be required to submit an abstract by 1 November 2017. A collection of submitted abstracts will be provided for all participants at the Symposium. The Council of the International Glaciological Society has decided to publish a thematic issue of the *Annals of Glaciology* on topics consistent with the Symposium themes. Participants are encouraged to submit manuscripts for this *Annals* volume.



## SYMPOSIUM ORGANIZATION

Magnús Már Magnússon (International Glaciological Society)

## SCIENCE STEERING AND EDITORIAL COMMITTEE

Co-chairs: Alex Anesio, Andrew J Hodson and Martyn Tranter

Scientific Editors: Further editors will be announced as they are appointed.

## LOCAL ORGANIZING COMMITTEE

Nozomu Takeuchi (Chair), Shiro Kohshima, Kumiko Azuma, Tetsuo Ohata, Shin Sugiyama, Kazunari Ushida, Teruo Aoki, Yuji Kodama, Jumpei Kubota, Kazuo Takeda, Kenji Kawamura, Koichi Watanabe, Konosuke Sugiura, Naoko Nagatsuka, Rigen Shimada, Sumito Matoba, Keisuke Suzuki, Koji Fujita, Tsutomu Uchida, Jun Uetake, Satoru Yamaguchi, Yukihiro Onuma, Akane Tsushima, Takahiro Segawa

## VENUE

The symposium will be held at the Kyoto Prefectural University in Kyoto city. Kyoto is located in the western (Kansai) area of Japan and is connected by railways, including the Shinkansen, the high-speed railway line that connects Japan's major metropolitan areas such as Tokyo and Osaka. The nearest international airport is Kansai Airport. The university is accessible in 15 minutes by subway from Kyoto railway station. It is surrounded by cultural facilities such as the Botanical Garden, the Prefectural Museum for Historical and Literary Research Materials and Kyoto Concert Hall. The quiet environment near the Kamo River and Mount Hiei offers a comfortable atmosphere for the symposium.

## LOCATION

Kyoto is often called 'Japan's heartland', and it is said that no one understands the real Japan without knowing Kyoto. The city has more than 1200 years of history. For 1100 years it was the imperial capital of Japan. A place nurtured by time, Kyoto is also changing into a modern city, where great ideas are born and culture continues to develop. The visitor can't help but be touched by the wonder of this special city. You will enjoy its natural scenery, temples, shrines, towns, homes, people and food. March is one of the best seasons in Kyoto, with beautiful weather and an average daily temperature range of 4–13°C. The cherry blossom may be in full bloom soon after the symposium.

## FURTHER INFORMATION

Please register your interest online if you wish to attend the symposium at <http://www.igsoc.org/symposia/2018/kyoto>.

The Second Circular will give further information about accommodation, the general scientific programme, additional activities, preparation of abstracts and final papers. Members of the International Glaciological Society will automatically receive one, as will all those who have pre-registered. Information will also be updated on the IGS conference website, <http://www.igsoc.org/symposia/2018/kyoto/> as it becomes available. A local website will open later in 2016.



# Glaciological diary

\*\* IGS sponsored

\* IGS co-sponsored

## 2017

22–26 January 2017

### **14th Conference on Polar Meteorology and Oceanography**

held as part of the 97th Annual Meeting of the American Meteorological Society  
Seattle, WA

Website: <https://annual.ametsoc.org/2017/index.cfm/programs/conferences-and-symposia/14th-conference-on-polar-meteorology-and-oceanography/>

23–25 January 2017

### **Workshop: Dynamics and Mass Budget of Arctic Glaciers/IASC Network on Arctic Glaciology Annual Meeting**

Bethel, Maine, USA

1–3 February 2017

### **Workshop: Arctic Change and its Influence on Mid-Latitude Climate and Weather**

Washington, DC, USA

Website: <https://usclivar.org/meetings/2017-arctic-midlatitude-workshop>

2–3 February 2017

21st Alpine Glaciology Meeting  
Zürich, Switzerland

Contact: Martin Funk [[funk@vaw.baug.ethz.ch](mailto:funk@vaw.baug.ethz.ch)]

6–9 February 2017

Circum-Arctic Flux Workshop  
Hyytiälä, Finland

7–9 February 2017

EARSeL workshop: Remote Sensing of the Cryosphere: Past – Present – Future  
Bern, Switzerland

12–17 February, 2017

### **\*\*International Symposium on the Cryosphere in a Changing Climate**

Wellington, New Zealand

Contact: Secretary General, International Glaciological Society

20–24 February 2017

### **Practice Meets Science: International Advanced Training Course on ‘Snow and Avalanches’ 2017**

Davos, Switzerland

Website: [http://www.slf.ch/dienstleistungen/events/practice\\_meets\\_science/index\\_EN](http://www.slf.ch/dienstleistungen/events/practice_meets_science/index_EN)

20–24 March 2017

### **North-American CryoSat Science Meeting**

Banff, Alberta, Canada

Website: <http://www.cryosat2017.org/>

23–25 March 2017

### **47th Annual International Arctic Workshop**

Buffalo, New York, USA

Website: <https://www.arcus.org/events/arctic-calendar/26757>

25–26 March 2017

### **Gordon Research Seminar, Polar Marine Science: Advancing the Physical–Biological Understanding of Polar Marine Ecosystems Through Innovative Technology**

Ventura, California, USA

26–31 March 2017

### **Gordon Research Conference, Polar Marine Science**

Ventura, California, USA

27–29 March 2017

### **4th Polar Prediction Workshop**

Bremerhaven, Germany

Contact: Betsy Turner-Bogren <[betsy@arcus.org](mailto:betsy@arcus.org)>

29–30 March 2017

### **2nd Sea Ice Model Intercomparison Project Meeting (2nd SIMIP Meeting)**

Bremerhaven, Germany

31 March–7 April 2017

### **Arctic Science Summit Week**

Prague, Czech Republic

Website: <http://www.assw2017.eu/>

3–5 April 2017

### **SLAM3 (Slab Avalanche Multi-scale Mechanical Modeling) Workshop**

Davos, Switzerland

Website: [http://www.slf.ch/dienstleistungen/events/slab\\_avalanche/index\\_EN](http://www.slf.ch/dienstleistungen/events/slab_avalanche/index_EN)

19–21 April 2017

### **International Workshop: Airborne Geodesy and Geophysics with Focus on Polar Application**

Dresden, Germany

Second Circular at <https://tu-dresden.de/bu/umwelt/geo/ipg/gef/die-professur/ws-polar-airborne-geo>

23–28 April 2017

**European Geosciences Union General Assembly 2017**

Vienna, Austria

Website: <http://egu2017.eu/home.html>

8–11 May 2017

**Minisymposium MS3.5: X-ray Microtomography of Snow and Porous Ice Media**  
to be held at the 9th International Conference on Porous Media & Annual Meeting  
Rotterdam, Netherlands  
Website: <http://www.interpore.org/116-event-booking/9th-international-conference-on-porous-media-annual-meeting/319-minisymposia14>

9–13 May 2017

**Past Global Changes (PAGES) Open Science Meeting (OSM)**

Zaragova, Spain

Website: <http://www.pages-osm.org/>

15 May–2 June 2017

**Arctic Field Summer Schools: Norway-Canada-USA collaboration**

Svalbard and Tromsø, Norway

Website: <http://cirfa.uit.no/intpart-project-to-cirfa-arctic-field-summer-school>

22–25 May 2017

**International Conference on High Latitude Dust 2017**

Reykjavík, Iceland

Website: <http://www.geomorphology.org.uk/meetings/international-conference-high-latitude-dust-2017>

22–26 May 2017

**Úa user meeting and course for new users**

Cambridge, UK

Contact Hilmar Gudmundsson <[ghg@bas.ac.uk](mailto:ghg@bas.ac.uk)>

22–26 May 2017

**5th International Conference of the IASC thematic network 'Palaeo-Arctic Spatial and Temporal (PAST) Gateways'**

Kristineberg Research Station,

Gullmarsfjord, Sweden

Website: <http://rechenknecht.natgeo.su.se/PGW2017/>

23–25 May 2017

**Community Surface Dynamics Modeling System (CSDMS) Annual Meeting**

Modeling Permafrost: a new software toolbox to explore frozen grounds

Hands-on Permafrost Modeling Clinic

Boulder, Colorado, USA

Website: <http://csdms.colorado.edu/wiki/>

Form:Annualmeeting

28–31 May 2017

**Canadian Geophysical Union Annual Scientific Meeting**

Vancouver, British Columbia, Canada

Website: [cgu-ugc2017meeting.ca/destination/](http://cgu-ugc2017meeting.ca/destination/)

28 May–1 June 2017

**Joint UK–Russia Workshop: Climate Change Impacts on Surface Water and Groundwater Hydrology in Cold Regions**

Yakutsk, Russia

Website: [sites.google.com/view/cold-regions-hydrology](http://sites.google.com/view/cold-regions-hydrology)

Contact Liudmila Lebedeva <[ru.uk.coldregionshydrology@gmail.com](mailto:ru.uk.coldregionshydrology@gmail.com)>

4–8 June 2017

Permafrost conference – Earth's Cryosphere:

Past, Present and Future

Pushchino, Russia

Website: [www.cryosol.ru](http://www.cryosol.ru)

Contact [cryoconference@gmail.com](mailto:cryoconference@gmail.com)

6–8 June 2017

**74nd Eastern Snow Conference**

Ottawa, Canada

Website: [www.easternsnow.org/](http://www.easternsnow.org/)

19–22 June 2017

**Forum for Research into Ice Shelf Processes: 31st FRISP workshop**

Bergen, Norway

Website: [folk.uib.no/ngfso/FRISP/news.html](http://folk.uib.no/ngfso/FRISP/news.html)

26–29 June 2017

**International conference Snow cover, atmospheric precipitation, aerosols: climate and ecology**

Irkutsk, Russian Federation

Website: [conf.istu.edu/event/6/](http://conf.istu.edu/event/6/)

2–6 July 2017

**2nd Asian Conference on Permafrost**

Sapporo, Japan

Website: [acop2017.arc.hokudai.](http://acop2017.arc.hokudai.ac.jp/#excursion)

[ac.jp/#excursion](http://ac.jp/#excursion)

7–9 July 2017

**International youth scientific and practical conference: Innovations in Geology, Geophysics and Geography**

Sevastopol, Russia

Website: [folk.uib.no/ngfso/FRISP/news.html](http://folk.uib.no/ngfso/FRISP/news.html)

10–12 July 2017

**Third Pole Science Summit: TPE-CSTP-HKT Joint Conference**

The Coupled Physical, Chemical, Biological and Social Systems in the Third Pole: Impacts, Feedbacks and Adaptation Pathways

Kunming, China

Website: [tpss2017.tpe.ac.cn/](http://tpss2017.tpe.ac.cn/)

14–19 July 2017

**\*Climate Impacts on Glaciers and Biosphere in Fuego-Patagonia**

Berlin, Germany

Contact: Christoph Schneidern <christoph.schneider@geo.hu-berlin.de>

Website: [https://www.geographie.hu-berlin.de/en/professorships/climate\\_geography/patagonia\\_workshop](https://www.geographie.hu-berlin.de/en/professorships/climate_geography/patagonia_workshop)

1–2 August 2017

**International Workshop on Cryospheric Change and Sustainable Development**

Lanzhou, China

2nd circular at [http://www.igsoc.org/symposia/lanzhouworkshopsecondcircular\\_0316.docx](http://www.igsoc.org/symposia/lanzhouworkshopsecondcircular_0316.docx)

6–12 August 2017

**21st Northern Research Basins (NRB) symposium and workshop: Cold-region hydrology in a non-stationary world**

Yakutsk, Russia

Website: <http://www.nrb2017.ru/>

14–19 August 2017

**\*\*International Symposium on Polar Ice, Polar Climate and Polar Change: Remote sensing advances in understanding the cryosphere**

Boulder, Colorado, USA

Contact: Secretary General, International Glaciological Society

4–8 September 2017

**European Conference for Applied Meteorology and Climatology 2017**

Session UP2.4: The cryosphere and its interactions with meteorology and the climate system. Convener: Renato R. Colluci  
Dublin, Ireland

Website: <http://www.ems2017.eu/>

6–7 September 2017

**\*\*International Glaciological Society British Branch Meeting**

Lancaster University

Contact: Amber Leeson <a.leeson@lancaster.ac.uk>

Website: <http://wp.lancs.ac.uk/igs-bb/registration/>

10–15 September 2017

**SCAR/Past Antarctic Ice Sheet (PAIS) conference**

Trieste, Italy

Website: <http://pais-conference-2017>

12–23 September 2017

**Karthus course: Ice Sheets and Glaciers in the Climate System**

Karthus, Italy

Website: <http://www.projects.science.uu.nl/iceclimate/karthus/>

4–5 October 2017

**1st International SCAR–ANTPAS workshop**

Varese, Italy

General information as PDF at

<http://www.igsoc.org/symposia/istinternationalantpasworkshopgeneralinfo.pdf>

9–11 October 2017

**Workshop: Improved Satellite Retrievals of Sea-ice Concentration and Sea-ice Thickness for Climate Applications**

Hamburg, Germany

Contact Stefan Kern <stefan.kern@uni-hamburg.de> or Dirk Notz <dirk.notz@mpimet.mpg.de>

25–27 October 2017

**\*\*International Glaciological Society Nordic Branch Meeting**

Uppsala, Sweden

Contact: Veijo Pohjola <veijo.pohjola@geo.uu.se>

**2018**

14–19 March 2018

**\*\*International Symposium on Cryosphere and Biosphere**

Kyoto, Japan

Contacts: Secretary General, International Glaciological Society

Professor Nozomu Takeuchi, Chiba

University, Chiba, Japan <takeuch@faculty.chiba-u.jp>

Early summer 2018

**\*\*International Symposium on Timescales, Processes, and Ice Sheets Changes**

Buffalo, NY, USA

Contacts:

Secretary General, International Glaciological Society (IGS)

Beáta Csathó; University at Buffalo, NY, USA <bcsatho@buffalo.edu>

15–27 June 2018

**SCAR/IASC Conference**

Davos, Switzerland

Contact: SCAR Secretariat [info@scar.org]

**2019**

24–28 June 2019

**\*\*International symposium on Five Decades of Radioglaciology**

Stanford, California, USA

Contacts:

Secretary General, IGS

Dustin Schroeder <Dustin.M.Schroeder@stanford.edu>





# New members

**Mr Michael Allchin**

Northern Hydrometeorology Group  
University of Northern British Columbia  
3333 University Way, Prince George, BC Canada  
V2N 4Z9  
E-mail: michael.allchin@unbc.ca

**Mr Xavier Allègre**

Stockholm University  
Department of Physical Geography  
SE-106 91 Stockholm, Sweden  
E-mail: allegre.xavier@gmail.com

**Mr Alvaro Ayala**

Swiss Federal Institute of Technology (ETH)  
IHW HIL G28.2, Gloriastrasse 37/39,  
CH8093 Zurich, Switzerland  
E-mail: ayala@ifu.baug.ethz.ch

**Ms Jessica Badgeley**

Earth and Space Sciences, University of  
Washington  
4000 15th Avenue NE, Seattle, WA 98015, USA  
Tel: +1 2069102992  
E-mail: badgeley@uw.edu

**Mr Shane Bilish**

Snowy Hydro Ltd  
PO Box 332, Cooma, NSW 2630, Australia  
E-mail: shane.bilish@snowyhydro.com.au

**Mr Anders Anker Bjørk**

Natural History Museum of Denmark, University  
of Copenhagen  
Øster Voldgade 57, 1054, DK1350 Copenhagen,  
Denmark  
Tel +45 29921742  
E-mail: andersb@snm.ku.dk

**Mr Adam D. Booth**

School of Earth and Environment, University of  
Leeds  
Woodhouse Lane, Leeds LS2 9JT, UK  
Tel \_44 (0)1133439743  
E-mail: a.d.booth@leeds.ac.uk

**Ms Lisa Crow**

Department of Geology, University of Otago  
PO Box 56, Dunedin 9054, New Zealand  
E-mail: crali915@student.otago.ac.nz

**Mr Pascal E. Egli**

Institute of Earth Surface Dynamics, Université de  
Lausanne  
Quartier UNILMouline, Bâtiment Géopolis,  
CH1015 Lausanne, Switzerland  
Tel +41 21 692 44 05  
E-mail: pascal.egli@unil.ch

**Mr Lukas J. Eling**

Antarctic Research Centre, Victoria University of  
Wellington  
PO Box 600, Wellington 6140, New Zealand  
E-mail: lukas.eling@vuw.ac.nz

**Mr Martin Forbes**

School of Surveying, University of Otago  
PO Box 56, Dunedin 9054, New Zealand  
Tel +64 210396954  
E-mail: martin8forbes@gmail.com

**Mr Edward Gasson**

Department of Geography, University of Sheffield  
Winter Street, Sheffield S10 2TN, UK  
E-mail: egw.gasson@gmail.com

**Mr Feng Hu**

China Water Risk  
Suite 2406, 9 Queen's Road, Central, Hong Kong  
E-mail: feng.hu@me.com

**Ms Wilma Huneke**

Institute for Marine and Antarctic Studies,  
University of Tasmania  
Private Bag 129, Hobart 7000, Australia  
E-mail: wilma.huneke@utas.edu.au

**Ms Kaitlin Keegan**

Dartmouth College  
14 Engineering Dt, Hanover NH 03755, USA  
E-mail: kaitlin.keegan@gmail.com

**Mr Dan Kluskiewicz**

Department of Earth and Space Sciences,  
University of Washington  
Johnson Hall Rm-070, Box 351310, 4000 15th  
Avenue NE, Seattle, WA 98195-1310, USA  
E-mail: dklus@uw.edu

**Frau Christiane A. Mögele**

University of Natural Resources and Life Sciences  
Institut für Alpine Naturgefahren,  
Schwackhöferhaus, Peter-Jordan-Straße 82,  
A-1190 Wien, Austria  
E-mail: chrham@students.boku.ac.at

**Mr Arnab Muhuri**

CSRE, Indian Institute of Technology Bombay  
c/o Prof. Avik Bhattacharya, 104, CSRE, IIT  
Bombay, Powai, Mumbai 4000 76, India  
E-mail: muhuri.arnab@iitb.ac.in

**Dr Anais J. Orsi**

Laboratoire des sciences du climat et de  
l'environnement  
CEA Saclay, Orme des merisiers, bat 701,  
F91191 Gif Sur Yvette, France  
E-mail: anais.orsi@lscce.ipsl.fr

**Ms Rebecca Parker**

Department of Geology, University of Otago  
PO Box 56, Dunedin 9054, New Zealand  
E-mail: rebeccaparkernz@gmail.com

**Mr Andrew G. Pauling**

Department of Physics, University of Otago  
PO Box 56, Dunedin 9054, New Zealand  
Tel +64 3 479 7755  
E-mail: pauan857@student.otago.ac.nz

**Ms Siobhan Prise**

School of Earth and Environment, Univ. of Leeds  
Earth & Environment Building, Leeds LS2 9JT, UK  
Tel +44 (0)7837564390  
E-mail: eespr@leeds.ac.uk

**Mr Todd Redpath**

Dept of Geography, University of Otago  
PO Box 56, Dunedin 9054, New Zealand  
E-mail: todd.redpath@postgrad.otago.ac.nz

**Mr Thomas Reerink**

IMAU, Utrecht University  
Buys Ballotgebouw, Princetonplein 5, Kamer 6.62,  
3584 CC Utrecht, Netherlands  
Tel +31 654685866  
E-mail: tjreerink@gmail.com

**Ms Joellen L. Russell**

Geosciences, University of Arizona  
1040 E 4th Street, Tucson, AZ 85721, USA  
Tel +1 5206262194  
E-mail: jrussell@email.arizona.edu

**Miss Catherine Sangster**

Department of Physics, University of Otago  
First Floor, Science 3 Building, 730 Cumberland  
Street, Dunedin 9016, New Zealand  
Tel 0273672396  
E-mail: catherine.a.sangster@gmail.com

**Mr Benjamin Schröter**

Institute of Cartography, TU Dresden  
Helmholtzstraße 10, D01069 Dresden, Germany  
E-mail: benjamin.schroeter@tudresden.de

**Mr Siddharth Shankar**

Geology, University of Kansas  
1475 Jayhawk Drive, Lawrence, KS 66045, USA  
E-mail: s.shankar@ku.edu

**Miss Laura Stocker**

Lancaster University  
5 Edward Street, Lancaster LA1 1QH, UK  
E-mail: l.stocker@lancaster.ac.uk

**Mr Jamey Stutz**

Antarctic Research Centre, Victoria University of  
Wellington  
523 Cotton Building, Kelburn Campus,  
Wellington 6011, New Zealand  
Tel +64 (0)223055318  
E-mail: jamey.stutz@vuw.ac.nz

**Ms Sayli Tawde**

Centre for Atmospheric and Ocean Sciences,  
Indian Institute of Science  
Bangalore, Bangalore Karnataka 560012, India  
Tel +91 9611066821  
E-mail: saylitawde@gmail.com

**Mr Dario T. Trombotto Liauda**

Geocryology, CONICET  
Av. Ruiz Leal s/n Parque General San Martín,  
Mendoza 5500, Argentina  
Tel +54 261 524 4208  
E-mail: dtrombot@lab.cricyt.edu.ar

**Ms Lauren Vargo**

Antarctic Research Centre, Victoria University of  
Wellington  
PO Box 600, Wellington 6140, New Zealand  
E-mail: lauren.vargo@vuw.ac.nz

**Ms Rebecca M. Vignols**

Newnham College, Cambridge CB3 9DF, UK  
Tel 07951888835  
E-mail: regnos32@bas.ac.uk

**Mr Sebastián Vivero**

Institute of Earth Surface Dynamics, University of  
Lausanne  
Bureau 3109 Géopolis, Quartier UNIL Mouline,  
CH 1015 Lausanne, Switzerland  
sebastian.viveroandrade@unil.ch

**Ms Natalya Volgusheva**

NEFU  
Belinskogo str 58, Yakutsk 677000, Russia  
natalya.volgusheva@gmail.com

**Mr Ross Whitmore**

Victoria University of Wellington  
PO Box 600, Wellington 6140, New Zealand  
ross.whitmore@vuw.ac.nz

**Mr Christian Wild**

Gateway Antarctica, University of Canterbury  
Private Bag 4800, Christchurch Canterbury 8041,  
New Zealand  
Tel 0064273212859  
christian.wild@pg.canterbury.ac.nz

**Mr Pat Wongpan**

Department of Physics, University of Otago  
PO Box 56, Dunedin, Otago 9054, New Zealand  
Tel 006434797530  
pat.wongpan@postgrad.otago.ac.nz

**Dr Xinyue Zhong**

Northwest Institute of EcoEnvironment and  
Resource, Chinese Academy of Sciences  
320 Donggang West Road, Lanzhou Gansu  
730000, P.R. China  
Tel +8613919419070  
xyzhong@lzb.ac.cn

# International Glaciological Society

Secretary General M.M. Magnússon

	Council Members	Concurrent service on Council, from
President	D.R. MacAyeal	2014–2017
Vice-Presidents	G. Flowers	2015–2018
	F. Pattyn	2014–2017
	S. Sugiyama	2014–2017
Immediate Past President	E. Brun	2014–2017
Treasurer	I.C. Willis	2015–2018
Elective Members	*L.M. Andreassen	2016–2019
	*H.A. Fricker	2015–2018
	*J.K. Hutchings	2015–2018
	*M. Ivanov	2016–2019
	*Kang Schichang	2015–2018
	*A. Mackintosh	2015–2018
	*M. Montagnat	2014–2017
	*D. Notz	2016–2019
	A. Rivera	2014–2017
	*B. Stenni	2014–2017
	*C. Tijm-Reijmer	2015–2018
Co-opted	K. Brunt	
	E. Enderlin	
	L. Koenig	

\*First term of service on the Council

## IGS Committees

Awards	L. Koenig (Chairman)
Nominations	E. Wolff (Chairman)
Publications	C.L. Hulbe (Chairman)

## Correspondents

Australia	P. Heil	Japan (Hokkaido)	S. Sugiyama
Argentina	J.P. Milana	Japan (Honshu)	K. Nishimura
	S. Marinsek	Netherlands	J. Oerlemans
Austria	E. Schlosser	New Zealand	H. Purdie
Belgium	J.-L. Tison	Norway	J.C. Kohler
Canada	H. Jiskoot	Poland	W. Dobinski
Chile	A. Rivera	Russia	V.N. Mikhalenko
China	Yao Tandong	Spain	F.J. Navarro
Denmark	A.P. Ahlstrøm	Sweden	R. Petersson
Finland	T. Vihma	Switzerland	F. Paul
France	C. Ritz	UK	B.P. Hubbard
Germany	O. Eisen	USA (Eastern)	T. Neumann
Iceland	P. Þorsteinsson	USA (Western)	H.B. Conway and
Italy	C. Smiraglia	USA (Alaska)	E.D. Waddington
			M.A. Nolan

## Seligman Crystal

1963 G. Seligman	1989 H. Oeschger	2001 G.K.C. Clarke
1967 H. Bader	1989 W.F. Weeks	2003 K. Hutter
1969 J.F. Nye	1990 C.R. Bentley	2005 R.B. Alley
1972 J.W. Glen	1990 A. Higashi	2007 L.G. Thompson
1972 B.L. Hansen	1992 H. Röthlisberger	2009 P.A. Mayewski
1974 S. Evans	1993 L. Lliboutry	2011 A. Iken
1976 W. Dansgaard	1995 A.J. Gow	2012 D.E. Sugden
1977 W.B. Kamb	1996 W.F. Budd	2013 P. Duval
1982 M. de Quervain	1997 S.J. Johnsen	
1983 W.O. Field	1998 C. Lorius	
1983 J. Weertman	1999 C.F. Raymond	
1985 M.F. Meier	2000 S.C. Colbeck	
1986 G. de Q. Robin	2001 G.S. Boulton	

## Honorary Members

G.K.C. Clarke	J.W. Glen
K. Higuchi	V.M. Kotlyakov
G. Østrem	G. Wakahama
Yang Zhenning	

## Richardson Medal

1993 H. Richardson	2012 W.S.B. Paterson
1997 D.R. MacAyeal	2013 J.W. Glen
1998 G.K.C. Clarke	2013 A. Weidick
1999 J.A. Heap	2016 T. Chinn
2003 C.S.L. Ommanney	2016 E.M. Morris
2010 T.H. Jacka	

The Society is registered as a charity in the United Kingdom with the Charity Commissioners – No. 23104



# International Glaciological Society

High Cross, Madingley Road  
Cambridge CB3 0ET, UK

## MEMBERSHIP

Membership is open to all individuals who have a scientific, practical or general interest in any aspect of snow and ice and benefits include online access to the *Journal* and *Annals of Glaciology* and *ICE*. To join please see our website at [www.igsoc.org/membership](http://www.igsoc.org/membership).

## ANNUAL MEMBERSHIP FEE 2017

	Sterling
Ordinary members	£72
Supporting members	£277
Contributing members	£137
Retired/partner members	£29
Student members (under 30 years or studying for PhD/MSc)	£36

Payment may be made on line using MasterCard, AmEx or VISA/Delta.

## ICE

Editor: M.M. Magnússon (Secretary General)

This news bulletin is available to members of the International Glaciological Society and is published online three times a year. Members can purchase hard copies at discounted rates.

Contributions should be sent to your National Correspondent or to the Secretary General, International Glaciological Society, High Cross, Madingley Road, Cambridge CB3 0ET, UK.

Annual cost for libraries, etc., and for individuals who are not members of the Society:

Sterling £45.00

All enquiries about the International Glaciological Society should be addressed to:

Secretary General, International Glaciological Society, High Cross,  
Madingley Road, Cambridge CB3 0ET, UK

Tel: +44 (1223) 355974 Fax: +44 (1223) 358334

E-mail: [igsoc@igsoc.org](mailto:igsoc@igsoc.org)

[www.igsoc.org](http://www.igsoc.org)