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Ice

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Contents

Cover picture: Mixture of lake ice and rime crystals on Lake Rauðavatn, Reykjavík, Iceland. Photo: Oddur Sigurðsson.

From the Editor

Dear IGS member

In this editorial I would like to inform you of some inevitable changes coming up for the IGS. Yes, this ICE issue is number 191, which is set as the first issue of 2023 or almost 2 years behind. Most of the material is up to date so I am going ahead with this 'announcement'.

As some of you are aware, I have been thinking of retiring for a while. I turned 70 this past July, so I am well past the regular retirement age here in the United Kingdom.

I have been Secretary General since 1 April 2003 and have witnessed great changes during that time. I have worked with six IGS Presidents and who knows how many elected Council members.

Although a firm date for my retirement has not been set, I have expressed my intention to retire during the first quarter of 2025. I have, however, said that I would be willing to be on hand to help my successor if needed.

The IGS President has already enlisted the help of some trusted members of the IGS to set out the path forward for the IGS. Now is a good time to change the tack of the Society. I did so when I started almost 22 years ago and I would expect my successor to do the same.

The first steps are to get the word out that the International Glaciological Society is looking for a new Secretary General and form a 'Search Committee' to approach suitable candidates to see whether they would be interested in applying for the position. That is how I got roped into applying. After a preset deadline for applications to be submitted, the Search Committee and the IGS Officers will review the applications and decide on suitable candidates and who to interview. This will have to be done under the auspices of an experienced Human Resources person.

When I applied for the position of the IGS SG in 2002, the then constitution of the IGS stated that the office of the IGS should be in Cambridge, UK. That was not a problem for me and my family. We packed up, bought a house in the vicinity of Cambridge and shipped all our belongings from Iceland to England. And we have never regretted that for a moment.

The IGS recently amended its constitution and now the stipulation relating to the location of the IGS office is simply that it needs to be in the United Kingdom. The reason it is restricted to the UK is because the IGS is registered in the UK as a Learned Society and a Charity. This brings with it several benefits, most importantly financial ones. Another reason relates to banking: I believe that signatories to the IGS bank accounts must be residents of the UK.

However, it is not just the Secretary General who will be leaving the IGS. The two people who continued to work for the IGS once we sub-contracted our journals production to Cambridge University Press, Sukie Hunter and Louise Buckingham, have announced that they will retire around the same time as the Secretary General. Sukie has been working for the IGS since 2009 and Louise since 2011. Since the transfer of production over to CUP, Sukie has been busy working on producing *ICE*, compiling circulars and interactive material for symposia and various other IT-related tasks. Louise has worked as our 'Membership and Accounts Manager' and as such has been taking care of your renewals and solving all your problems related to registration and payments for symposia. She has been in charge of our accounts, making sure all income and expenditure is posted to the correct 'departments' and coded correctly. She has balanced our bank accounts and taken care of Value Added Tax (VAT) postings and all payments, both incoming and outgoing. Sukie and Louise will both be sorely missed.

All these posts will have to be filled early in the new year. All of us will be available to help the incoming people.

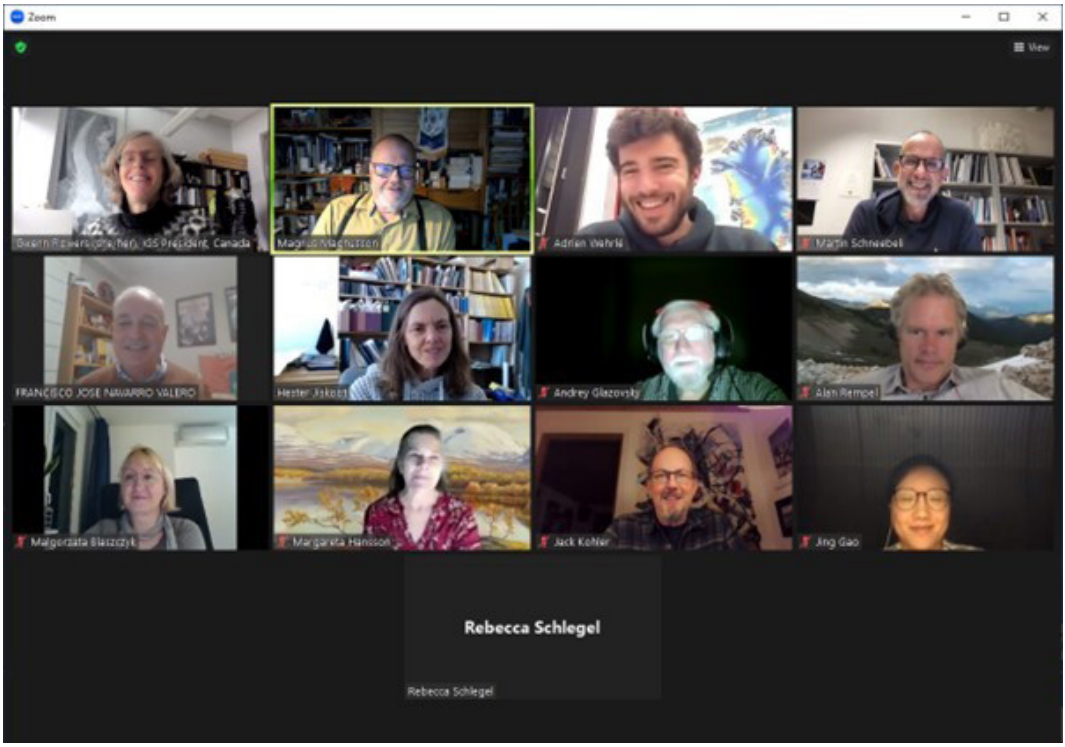
Another change that is upon us is the way many offices are now operated in the UK. During Covid and lockdown, people started working from home and have largely continued to do so. As you may be aware, the IGS has been leasing office space from the British Antarctic Survey, BAS. BAS falls under the auspices of the UK's National Environmental Research Council, NERC.

Following the lockdown, many employees have preferred to continue working from home, leaving offices sitting empty. NERC has thus introduced the so called 60/40 rule which specifies that for an employee, or a tenant, to be given a permanent office space they will have to be present in the office for at least 3 days out of 5 per week. We do not fulfil that criterion and thus in future we will be 'hotdesking', as it is commonly termed. Outwardly, nothing will change but if you are planning to drop into the office please let us know in advance so we can make sure we are there. Having said this, it is entirely possible that a new Secretary General will want to move the office somewhere other than Cambridge – but it will still be within the UK, for the reasons mentioned above.

Magnús Már Magnússon
Secretary General

IGS's Inaugural On-line Council Meeting

The first official on-line meeting of the IGS Council took place on 29/30 November 2022. Among the 18 attendees, spanning 21 time zones, there were 13 elected Council Members, three Ex-officio members, the Secretary General and the Chair of the IGS Early-career Glaciologists Group (EGG). In addition to regular business, Council formally passed 63 items that had been approved during the pandemic. We are enormously grateful to the IGS Ad-hoc Committee on Governance Changes, chaired by Regine Hock, who initiated and shepherded the changes to the IGS Constitution required to make remote Council Meetings possible.



Alpine Glaciology Meeting

9–10 February 2023, Birmensdorf, Switzerland

The 26th Alpine Glaciology Meeting (AGM), held in Birmensdorf Switzerland on 9 and 10 February 2023 allowed the glaciological community across the Alps to gather physically in one place after 2 years dominated by COVID-cancellations and online formats. Like IGS branch meetings, AGM is often one of the first meetings attended by many PhD students, who get an opportunity to present their latest research in a welcoming and informal environment.

AGM is a victim of its own success, with a record attendance of more than 160 attendees. The Swiss hosts were very successful in accommodating the largest AGM of all time in the WSL facilities in Birmensdorf, reachable by public buses crowded with joyful glaciologists at rush hours.

Some older folks might regret the good old days of AGM when presenters would write the title of their communication in the morning on a blackboard and would elaborate the programme on the spot. This is clearly not what happened for AGM 2023, as the dense programme elaborated in advance by the organizing committee (Daniel Farinotti ETH/WSL, Thomas Shaw WSL and Martin Lüthi UZH) and WSL event management (Susanne

Daniel Farinotti was in control.

There were a record number of people at this meeting. Luckily the organizers opted for a big venue.

There was a new method to inform speakers that their time was up.

Because of the number of posters the main poster session was held in the WSL storage/workshop.

Senn) was strictly followed. We heard a series of excellent talks covering a wide spectrum of glaciology, from artificial intelligence to stake measurements. Speakers were asked to keep to time strictly, as they were reminded by the electronic hour glass and even more by the gong, which was heard only once. The poster hall was a gigantic storage room that gave a taste of fieldwork preparation. A special session was dedicated to the extreme summer of 2022, in which repeated heat waves hit glaciers hard, causing unprecedented high melt up to the highest elevations. This session ended with an emotional perspective about the disappearing alpine glaciers and the fact that summer 2022 marked the abandonment of at least four glaciological mass balance series in the Alps.

The dinner in Zurich was the perfect opportunity to present the Richardson medal to its 2019 recipient Johannes (Hans) Oerlemans. Hans is recognized for his outstanding service to the community, which includes the organization of the Karthaus Summer School, initiated in 1995, which has been attended by no fewer than 500 glaciologists.

The organizers emphasized at the beginning that this should be a friendly meeting in a welcoming atmosphere. Unfortunately, some inappropriate and unnecessary gender-related comments were made during the meeting. The organizers followed up reports of such behaviour with direct communication and explanation of its unacceptable nature to the (few) perpetrators. We look forward to the same policy being applied at future AGMs as it strengthens the inclusivity of our community to all minorities going forward. All participants in IGS related events and members of IGS are reminded that they are expected to behave in accordance with the IGS core values and scientific code of conduct (https://www.igsoc.org/wp-content/uploads/2021/10/corevalues.pdf).

The banquet dinnerwas wonderful.

Hans Oerlernans with his RIchardson Medal.

Having a big meeting like this one running smoothly is impossible without all the support by an efficient team working behind the scenes. It is very much appreciated by all the participants.

Fanny Brun
Photos by Magnús Már Magnússon.

Sea Ice across Temporal and Spatial Scales

IGS Sea Ice Symposium, 4–9 June 2023, Bremerhaven, Germany

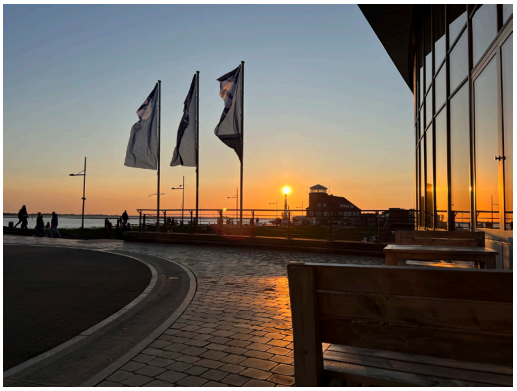
In June 2023, nearly 300 registered sea ice experts from all over the world were hosted by the Alfred Wegener Institute and University of Bremen in Bremerhaven, Germany, at the IGS Sea Ice Symposium, a global sea ice event taking place every 4–5 years, and last held in Winnipeg, Manitoba, Canada, in 2019. The symposium took place in the conference center of the Atlantic City Hotel, an iconic Dubai-style hotel right at the waterfront of the river Weser.

The symposium theme of 'Sea Ice across Temporal and Spatial Scales' alludes to the huge importance of sea ice for large- and small-scale processes and interactions with the atmosphere and ocean in both polar regions, affecting their climate, ecosystems and human activities. The symposium attempted to provide answers to the overarching, striking facts that global sea ice coverage is changing rapidly, with Arctic sea ice extent halving over the last four decades and Antarctic sea ice coverage only recently but rapidly plummeting to new record lows after decades of stagnation. These changes require improved understanding of

The Icebreaker on the Sunday evening was held on the historic three-masted sailing ship Segelschulschiff Deutschland*, and the weather couldn't have been better.*

The symposium venue was right on the waterfront of the river Weser

It was a great opportunity to liaise with old friends and make a few new ones..



The symposium venue was right on the waterfront of the river Weser

The view from the hotel was amazing.

Like all the IGS Sea Ice symposia, this one was very well attended..

underlying causes and consequences, and prediction of future sea ice development. Therefore, the conference included a wide range of sessions from sea ice physics and modelling and remote sensing to oceanography, atmospheric physics and chemistry, and biogeochemistry and ice-associated ecosystems, with a strong focus on interdisciplinary themes, addressing recent changes, field and model campaigns, and basic concepts.

The symposium began on Sunday afternoon with a registration and Icebreaker reception held on the historic three-masted sailing ship *Segelschulschiff Deutschland* next to the Atlantic hotel. Old and new friends met on the crowded deck of the ship enjoying drinks and snacks and excellent, sunny weather. On Monday morning, the symposium was opened by AWI's director Antje Boetius. A microbiologist and deep-sea researcher herself, she gave an engaging speech attesting to her own enthusiasm for sea ice and its role in the polar systems and as a source of inspiration. The morning plenary session was concluded by a tribute to the late David Barber, a leader of sea ice research in Canada and chair of the previous sea ice symposium in Winnipeg, who died in 2022. The excellent tribute was prepared by Feiyue Wang and John Yackel and included photos and videos both of David's personal and professional life, including on the sea ice during field work, nicely setting the stage for what was to come in the following days and what sea-ice science and the people behind it are all about.

The symposium was organized into a morning plenary session and then three parallel sessions for the rest of the day. The large plenary hall could be split into two in minutes to provide the required spaces. Two poster sessions on Monday and Tuesday afternoon gave ample opportunities for personal interaction and deep scientific discussions, helped by servings of beer and wine. Morning, lunch and afternoon breaks with excellent catering by the conference hotel helped to keep everyone awake and well fed. The relatively limited space in the lobby was easily crowded and gave everything an intimate, personal feel with little opportunity for escaping each other.

AWI director Antje Boetius made a speech to open the symposium.

Feiyue Wang and John Yackel presented a tribute to the late David Barber, who had hosted the Sea Ice symposium in 2019.

Wonderful sunny weather invited us to go outside and to enjoy the views of the waterfront and ships on the river.

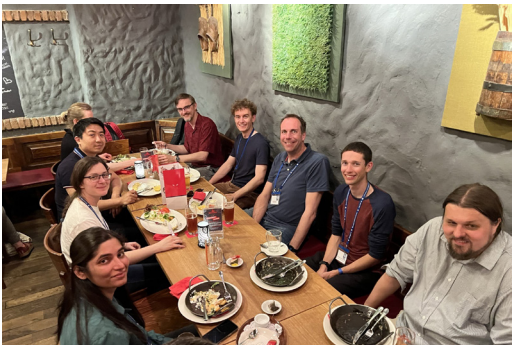
An excellent social programme accompanied the symposium. On Wednesday afternoon participants could choose from a variety of educational, sight seeing or activity excursions. These included canoeing on a nearby river, tree climbing in a forest park, or walking the mudflats of the Wadden Sea. Boat tours were offered of the Bremerhaven harbour and rural peatlands. There were also tours to the city of Bremen with the Bremen Drop Tower and AWI's research aircraft Polar 5 and 6, which are used for sea-ice surveys. Finally, participants could choose to take guided tours of two excellent museums in Bremerhaven, the Climate House and the German Emigration Center. Again, excursions were blessed by good weather,

The midweek excursion to Bremen included a visit to the Bremen Drop Tower..

What are these suspicious-looking people hanging about in the street for?

The town hall of Bremen, in the Marktplatz..

Bremen boasts several statues of different types representing the Four Musicians of Bremen, immortalized in German folklore, despite the fact that the four musicians never actually made it to Bremen in the story.



Following an exhausting afternoon walking all over Bremen, all the diiferent groups met up for an evening meal featuring traditional German cuisine.

giving everyone the opportunity to improve their tan after days in meeting rooms.

Another highlight of IGS symposia are the Banquets on Thursday evenings. In Bremerhaven, we gathered at the Weser beach for an outdoor barbeque, award ceremonies, and for viewing a beautiful sunset over the Weser river. The evening had a fantastic, outdoor and summer vibe to it, and people were seen chatting and even dancing late into the night.

The following Friday was back to business as usual, ending with a short symposium conclusion ceremony in the early afternoon. There, the next Sea Ice Symposium was announced to be held in Hobart, Tasmania, in 2027 and organized by the University of Tasmania and Australian Antarctic Division. The concluding session ended a great week of celebrations of sea-ice science and enjoying collegial friendships, old and new, in the maritime atmosphere of Bremerhaven, blessed by the best early summer weather possible. For many, this was the first in-person meeting since the beginning of covid-19, and indeed since the last IGS meeting in Winnipeg. Maybe therefore it was not surprising that there was little interest in the initially offered online participation option, planned to reduce the expenses and climate footprints of potential participants. As only two participants had registered for online participation before the end of the early registration deadline, we decided to remove that option to significantly reduce the conference expenses, as offering effective online options was very expensive.

Conference organisation was much aided by excellent scientific and local organizing committees. We are most grateful to the

The symposium banquet/barbecue was held a stone's throw from the meeting venue in an outdoor restaurant. We used this occasion to present the awards for outstanding oral and poster *presentations from ECS and express our gratitude to all those who helped to organize this very succesful meeting.*

22 international members of the scientific steering committee, who not only screened abstracts, developed the programme and chaired sessions but also selected the winners of the Early Career Scientist Award competition. These were recognized during the conference banquet and are:

Oral:
Isolde Glissenaar, Marek Muchow, M. Katharina Stolla;
Honourable mention: Christopher Wyburn-Powell, Noah Day, Jakob Dörr, Alexander Mchedlishvili

Poster:
Daniela Krampe, Maren Elisabeth Richter, Mareike Bach;
Honourable mention: Janna Rückert, Emily R. Fedders, Jui-Chun Freya Chen

A number of Early Career Scientists applied for and received travel support generously supplied by the atmospheric, cryosphere, and marine working groups of the International Arctic Science Committee (IASC) after a request from the conference chairs.

Needless to say, the conference would not have been what it was without the support of IGS Secretary General and symposium veteran, the great grand Magnús Már Magnússon, and we are looking forward to his ongoing support for the publication of the symposium's volume of the *Annals of Glaciology* and the symposium in Hobart in 2027.

The winners of the Early Career Scientist awards posed for a photo on the sand.

At the closing ceremony we took the opportuntity to thank the members of the Scientific Steering Committee, who did so much to shape the symposium.

Amy Lauren Richman managed to get a photograph of all the participants on the waterfront.

The unique opportunity of having so many experts in one place was also used to hold a number of side meetings on the weekends before and after the symposium. These included meetings by the Antarctic Sea Ice Processes and Ecosystem (ASPeCt), Climate and Cryosphere (CliC) Sea Ice Working Group, Association of Polar Early Career Scientists (APECS), ESA Sea Ice Intercomparison Exercise (SIN'XS) Metrology group, International Artic and Antarctic Buoy Programmes (IABP and IPAB), and Sea Ice Model Intercomparison Project (SIMPI).

For lasting memories of the symposium please visit the conference website at https://www.igsoc.org/event/bremerhaven_2021 and https://igs2023.awi.de/, and the last issue of volume 65 of the *Annals of Glaciology*.

Christian Haas

Conference Chairs
Christian Haas, Gunnar Spreen, Marcel Nicolaus

Members of the SSC
Feiyue Wang, David Babb, Randy Scharien, Polona Itkin, Alexandra Jahn, Julienne Stroeve, Marcel Nicolaus, Gunnar Spreen, Jari Haapala, Letizia Tedesco, Wolfgang Rack, Axel J. Schweiger, Sinead Farrell, Thomas Lavergne, Mats Granskog, Takenobu Toyota, Ruibo Lei, Klaus Meiners, Alexander Fraser, Melinda Webster

Members of the LOC
Marcel Nicolaus (Chair), Gunnar Spreen, Christian Haas, Lilian Schubert, Stephanie Carstensen, Marietta Weigelt and members of the Sea Ice Section at AWI and HiWis from AWI and UBremen: Andreas Preusser (ECS travel grants and excursions), Anja Batzke, Jan Rohde, plus organizers/guides of excursions: Thomas Krumpen, Lena Happ.

Glaciology of the Southern Andes:

a plurinational and multidisciplinary experience

31 July–11 August 2023, Mendoza, Argentina

Introduction

In August of this year, we had the incredible experience of participating in the fifth running of the postgraduate course 'Glaciology of the Southern Andes' by the Argentinian Institute of Nivology, Glaciology and Environmental Sciences (IANIGLA-CONICET). For 12 days, 31 students from Argentina, Chile, Peru, Bolivia, Cuba and France met in Mendoza, Argentina, to learn about and share the cryosphere of the Southern Andes. The students, mostly graduate students and professionals from different areas, showed a genuine interest in Andean glaciology.

Academic content

During the first week, a wide range of topics were covered in the theoretical classes. The fundamentals, concepts and techniques of modern glaciology were explained with regional examples, allowing us to learn about the latest advances in glaciology, remote sensing techniques, glacial hydrology and numerical modeling of the cryosphere in the Southern Andes.

The theoretical classes were held in the Latin American Room of the Scientific and Technological Center CONICET Mendoza. Photo by Jonathan Oberreuter.

In the second week, the students met in groups dedicated to different geographical areas. Based on a series of practical exercises, each group had to perform mass and energy balance calculations, and analyze ice thickness and surface velocity, the changes that have occurred in recent decades, and the glaciers' contribution to river runoff in their geographical area and region.

The course culminated with the presentation of results obtained by each group, offering students an enriching and practical educational experience in the exciting field of glaciology.

Fieldwork

The synergy between theory and practice crystallized in an exciting 3-day field trip to Cordón del Plata Provincial Park in Mendoza's Central Andes. This unique environment provided the opportunity to assimilate the concepts previously acquired from analyzing various landscape elements, especially the spectacular debris glaciers that characterize the region. The activities included a trek from the High Mountain Refuge of the University of Cuyo (2800 m a.s.l.) to the Stepanek debris glacier (3500 m a.s.l.) in the Quebrada del Medio. Also, through the old ski slope of the Vallecitos center, we visited the local weather station and the Morenas Coloradas debris glacier (3450 m a.s.l.). The classroom learning and field experiences enriched our understanding of the complex geological and climatic processes that shape the glaciers of the Southern Andes in a unique and significant way.

Students and teachers at the Automatic Weather Station at the foot of the front slope of the Morenas Coloradas debris glacier. Photo by Giuliana Beltramone.

Students and teachers at the entrance to Cordón del Plata Park. During the traverses, glacial and periglacial landforms and wildlife such as guanacos and birds of prey were spotted. Photo by Jonathan Oberreuter.

Social activities

Our multinational and multidisciplinary group was imbued with values such as camaraderie, proactivity, solidarity and motivation. These values brought unique perspectives to each discussion, enriching the collective understanding of all course members. This spirit was reflected throughout the course, inside and outside the classroom. Among the most memorable moments were the knowledge exchanges during mid-morning coffee breaks, the warm conversations on our field trip, and the informal meetings outside the course schedule.

One of our most remarkable experiences was the dinner meeting for women glaciologists. In this trusting space, we shared experiences and insights that were often not discussed in other settings. This activity further strengthened our bonds, based on trust and mutual admiration, and we continued cultivating this connection throughout the course. We dare to say that we have created a South American network that can give rise to various projects of a plurinational, multidisciplinary and gender-sensitive nature.

During our field trip to Vallecitos, the long-awaited moment of relaxation finally arrived,

Women from Argentina, Chile, France, Cuba, Peru and Bolivia attended the women's dinner meeting.

After the final presentations, we gathered at the San Martin Park in Mendoza City to toast to two intense weeks of glaciology and camaraderie. Photo by Pierre Pitte.

culminating with a barbecue prepared by Juan Pablo Scarpa and 'Pepe' Corvalán, who deserved all the applause since they even considered a vegetarian option. Dancing and music as varied as the nationalities of the participants were added to this evening, creating an unforgettable night.

This course showed us that it is possible to work as a team between institutions and that the active participation of students and professionals from different areas of science can result in a complete and memorable learning experience.

We acquired knowledge and technical, personal, and professional tools but also formed networks and friendships. A 'glaciological family' that will surely meet again in the future. The fifth iteration of 'Glaciology of the Southern Andes' has left a unique and precious mark on our development path as professionals, contributing to the construction of knowledge about the valuable glacier systems in the past, present and future.

We thank the IANIGLA team, the Advanced Courses program of the CCT CONICET Mendoza, and the support of the International Glaciological Society (IGS), which made this course possible.

Students and professors at the Vallecitos Refuge of the National University of Cuyo, Photo by Pierre Pitte.

Lucas Ruiz

On behalf of the students (in alphabetical order):

Sebastián Alfaro (CL), Yerelin Carcamo (CL), Javiera Carraha (CL), Javiera Carrasco (CL), Gladis Celmi Henostroza (PE), Yadia Curo Rosales (PE), Raúl Correa (CL), Anai Grez (CL), Camilo Guzman (CL), Sofia López Morlhiere (AR), Jonathan Oberreuter (CL), Erika Pellegrini (AR), Helena Valenzuel (CL), and Nahuel Villarroel (CL).

A Personal Journey Through the Science of Ice Shelf–Ocean Interactions

Adrian Jenkins, Seligman Crystal acceptance speech

Slaley Hall, Northumberland, UK, September 2022

First of all, I would like to say a huge thank you to the International Glaciological Society (IGS) as a whole, and both to the Awards Committee and to those colleagues who took the time and effort to nominate me, in particular, for the immense honour represented by the prestigious award of the Seligman Crystal. Any award of this nature, coming from a body of scientists that I personally hold in such high esteem, is a gratifying, yet humbling, experience, but coming from IGS, it is especially significant for me. Despite having done very little work that is recognisably glaciological, I have always, from the very outset of my career, seen IGS as representing the intellectual home for my research. The tools I have used may have looked at times very oceanographic, but the motivation has always been the solution of glaciological problems. Indeed, I see this award as a recognition that the subject area of ice-ocean interactions has truly come of age, now being seen as a key part of the multi-disciplinary spectrum that glaciology encapsulates, and everyone who has shared in that development should take some of the credit. Indeed, science is a team effort, and what will become apparent through the following recollections is that I have been lucky enough to have worked alongside some brilliant scientists. If I have done one thing right or well, is it to have effectively absorbed those intellectual influences, and I will always be indebted to the people I have interacted with, and learned from, over the years.

Through its role in promoting our science, IGS has been absolutely fundamental in facilitating those interactions. IGS journals and symposia have been a continual source of inspiration, while the British Branch Meetings will always hold a special place in my recollections. The Branch Meeting in Manchester in September 1985 was my very first experience of a scientific gathering. I'd started my career as a glaciologist at the British Antarctic Survey (BAS) only a few weeks earlier, was due to go to Antarctica for my first field season a few weeks later, and actually travelled to the meeting directly from the BAS pre-deployment field course in the Peak District. It was socially and intellectually a stimulating experience; a wonderful opportunity to mingle with glaciologists at all career stages, including some earlier Seligman Crystal awardees. The Branch Meeting became an annual pilgrimage through much of my career until other commitments in the busy September period put a stop to that, and I have countless fond memories of discussions both in and beyond the lecture hall.

It is very fitting that I have formally received this award at the 35th Forum for Research into Ice Shelf Processes (FRISP). FRISP has been the other annual pilgrimage throughout my career, and its traditional mid-summer timing has meant that I have missed only a handful of those 35 meetings. The second workshop (then of the Filchner–Ronne Ice Shelf Programme), hosted at the Scott Polar Research Institute (SPRI), Cambridge, in June 1986 was the very first meeting at which I presented work; preliminary results from my first season of fieldwork on Ronne Ice Shelf. FRISP became a hugely important stimulus to the development of the field of ice–ocean interactions, was always a melting


Before and after photos, illustrating the impact of 35 years of ice-shelf-ocean-research on the researcher: 23-year-old ECR about to head to Antarctica for a second field season (left) and newly appointed professor at Northumbria University (right).

pot of ideas that brought glaciologists and oceanographers together, and has had an unfathomable influence on the research paths of myself and many others in the field.

While those periodic, intense interactions at meetings have been critical in shaping the direction of my science, day to day interactions with work colleagues have been fundamental in building on those foundations. I have been fortunate enough to have worked at two fantastic institutes, BAS for nearly 35 years and Northumbria University since 2020, where I have been able to feel part of an exciting scientific journey, at the core of which has been the science that has most interested me. Thriving in such environments, surrounded by such talented individuals, was more of an inevitability than an achievement. I hesitate to mention individuals, since there are too many to list and I don't want to cause any offence through omission, but I would personally like to recall some profoundly influential people, some of whom I am sadly unable to share the news of my award with.

First, and foremost, is Chris Doake, without whom I would not even be in science today, let alone accepting this award. Chris recruited me to BAS, entrusted me with a fantastic project of his conception on Ronne Ice Shelf, and acted as supervisor and mentor throughout my early career. When I applied to BAS I was attracted by the excitement of Antarctic fieldwork and the prospect of going places geographically that very few, if any, had been before. The post I had applied for was a 3-year contract, and never in my wildest dreams did I see BAS as a career choice. Indeed, it never even crossed my mind that I had what it took to be a scientist. But, under Chris's sympathetic and supportive mentorship I grew in confidence and found that I could get the same thrill of discovery that drew me to the fieldwork while sitting behind my desk in Cambridge, going places intellectually that very few, if any, had been before. Chris provided me with the perfect blend of guidance, whenever needed, coupled with the encouragement to pursue my own ideas. Perhaps the most pivotal moment in my entire career was when Chris supported my proposed change in direction, away from the flowline modelling of Ronne Ice Shelf that he had helped me build into my original PhD project plan, towards the development of a plume model to study the ice shelf's interaction with the ocean. My original concept was to couple the plume to an ice shelf flowline model, since I assumed that plume theory had essentially been exhausted by Doug MacAyeal's seminal paper that first made


Two major influences on my early career, both now sadly missed: my original inspiration and mentor, Chris Doake (left) and my first close collaborator, Andreas Bombosch (right), celebrating the award of his diploma.

use of the concept. However, by that stage I had effectively absorbed the ideas of Chris, and my second supervisor, Gordon Robin, on the processes of melting and freezing at the ice shelf base, and it eventually dawned on me that Doug's formulation of the plume concept overlooked that theory. To my surprise, I found that combining both theories gave something new, and from there I never looked back. Sadly, Chris passed away a few months before I received this award, leaving me unable to express to him personally the huge debt I owe him.

Just a couple of weeks before I submitted my thesis, I travelled to the 7th FRISP workshop, hosted at Schloss Senden, just outside Münster, Germany. There I met a diploma student, Andreas Bombosch, whose research project involved applying my plume model to a flowline on central Ronne Ice Shelf, in order to explain the accumulations of marine ice, up to 300 m thick, that had been discovered there. Over a beer in the castle courtyard, Andreas pointed out what he thought was an error in my formulation of the ice shelf melt/freeze rate. I'd taken my formulation from the literature, and although I had initially shared Andreas's doubts, I'd convinced myself that it was correct. As our discussions continued through the evening, I realised that my manufactured arguments about its correctness were on increasingly shaky ground, not just because of the beer. By the end of the evening, we agreed that I was wrong, and the next day, in a more sober state, we wrote down and agreed on a corrected formulation. I nervously edited my code, and to my great relief, found that the error had little impact on the results I had published and included in my thesis. However, the small impact meant that the correction did not address Andreas's problem of needing to simulate very high freezing rates. To achieve that we realized that we would have to incorporate the physics of frazil ice growth within, and deposition from, the plume. Andreas visited me in Cambridge, and we spent the summer trawling through the libraries at SPRI and Cambridge University, exploring the literature on frazil ice growth, powder snow avalanches and turbidity currents. A return visit late in the year allowed us to complete our model while splitting our time between the Christmas Markets and the University in Münster. Our work produced two papers and formed the basis of Andreas's diploma thesis and, with further development, his PhD thesis. He then came to work at BAS, where he was developing a simple numerical model of the 3-d circulation beneath an ice shelf

based on geostrophy and vertical friction, but tragically lost his life in a freak accident while on vacation. Our field lost a talented, well liked and hugely respected scientist, and I cannot help thinking that we would be further on had he lived. The theories he was working on have remained untouched, and I'm only now picking up the baton, with the help of a mutual colleague, Ole Anders Nøst, whom both Andreas and I met through FRISP. Working with Andreas taught me a number of important lessons that have served me well throughout my career: productive and lasting collaborations are built on friendship and mutual respect; never assume anything you see in the literature is correct, it is all the product of human minds, can easily contain errors, and can always be improved; there's nothing new under the sun, you will always find what you need in another field (ideally before you have re-invented the wheel); the application of old ideas that are nevertheless new to your field will always give novel insight; and, perhaps most importantly, you yourself can always be wrong (even if you have managed to convince the reviewers).

I have already mentioned, if not individually, many work colleagues to whom I am indebted, but it would be remiss of me not to mention a few key external, long-standing collaborators. Above all, Stan Jacobs has been a key figure in my development as an ersatz oceanographer since he invited me to join a cruise that he had planned to the Amundsen Sea in 1994. That was my first experience of seagoing oceanography, and indeed it was the first time anyone had made oceanographic measurements on the Amundsen Sea continental shelf. It was ground-breaking work that established beyond doubt the importance of ice-ocean interactions in the field of ice sheet glaciology, and I was fortunate and privileged to be involved in it. The following summer Stan and Hartmut Hellmer supported me on a three-month visit to Lamont-Doherty Earth Observatory (LDEO), to work with them on data from the cruise. During that time, I began working with David Holland, then just starting at LDEO, on the adaptation of the Miami Isopycnic Coordinate Ocean Model (MICOM) for use beneath ice shelves. I carried on working closely with David and Stan, funding repeated visits to LDEO and later New York University through joint proposals. Those times were not only extremely enjoyable, but also an essential learning experience. While I honed my skills in observational oceanography under Stan's guidance, from David I learnt just about everything I know about ocean modelling.

Among the most rewarding and memorable experiences of the past two decades have been the field campaigns I have undertaken in collaboration with the technical teams from the UK National Oceanography Centre who have developed and run the Autosub fleet of Autonomous

Arrival at the Rutford Ice Stream grounding, with field assistant Crispin Day, to complete the three summer seasons of field work that started my career in glaciology. Crispin, along with Rupert Summerson and Geoff Somers, who assisted in my first two seasons, contributed immeasurably to the success of the field work. Without them, I would not be here today.

Over 35 years, technological advances have transformed our ability to observe through and beneath the ice shelves. I have been lucky enough, with the help of some amazing collaborators, to have been involved in early applications of phase-sensitive radar (top) and autonomous underwater vehicles (bottom) to the study of ice-shelf–ocean interactions.

Underwater Vehicles (AUVs). Through many years of their effort and their willingness to take on huge challenges, they have provided the innovative technology that has allowed us to explore an otherwise hidden world beneath Antarctica's ice shelves. In particular, the 2009 cruise with Stan aboard *Nathaniel B Palmer*, coming six long years after our first abortive attempts, was an absolute career highlight. I'll never forget the feelings of relief each time the AUV was safely back on the deck of the ship and the excitement as downloaded data revealed an unknown world that nobody had seen before. That new knowledge changed forever our perception of glaciological change in West Antarctica.

Finally, I should acknowledge the huge influence that the Karthaus Summer Schools have had on my career. Started as part of the European Ice Sheet Modelling Initiative, they continued thanks to the efforts of Hans Oerlemans in securing financial support, and have become an enduring legacy of that project and Hans's dedication. I thank Hans for inviting me to teach at so many editions of the summer school and Georg Kaser for locating its home-from-home in the mountains of Northern Italy. Everyone who has participated in the summer schools, students and teachers alike, will have fond memories of those times. My excitement at receiving the invitations to teach was certainly heightened by the spectacular surroundings and warm welcome that were always waiting, but also by the unique opportunity it gave me to learn. I feel honoured and privileged to have been able to sit through so many lectures that deepened my understanding of many aspects of glaciology and to have had the opportunity to interact with so many young scientists who have gone on to shape the field. Those interactions taught me how valuable it is to have fresh minds thinking about problems where our own insight, while possibly developed through long experience, can become limited by familiarity. My thinking on plume theory, and its strengths and limitations as an analogue for the sub-ice-circulation, a subject that is woven throughout my career, has been indelibly shaped by the many discussions I've had with those to whom I've been introducing the subject at Karthaus, as well as those who've introduced me to analogous processes in the atmosphere and broader cryosphere.

Despite the advances, making observations beneath floating ice shelves remains hugely challenging, and that hidden world still holds many secrets for the next generation to discover. The field continues to grow in importance as we learn more about the ice sheets' pivotal role in climate change, and I feel privileged to have been able to be a part its development.

So, with apologies to all those who I've not had the time or space to explicitly mention, I gratefully acknowledge the debt I owe to everyone with whom I've discussed science over the years. Whether noticed at the time or not, your inputs have gone into the melting pot and come out in ways that probably neither of us imagined. The inspiration has come from you; the errors, where they have occurred, are all mine. And thanks again to IGS for the opportunities the Society has provided and for the recognition that the resulting work, despite the errors and occasional misconceptions, has made a, hopefully lasting, contribution to glaciology. Nobody could ask for a greater honour, and I will be forever grateful.

News

Seligman Crystal for Douglas I. Benn

Douglas (Doug) Benn (St. Andrews University, UK) has played a foundational role across a huge swath of glaciology, including studies of Snowball Earth, englacial hydrology, debris-covered Himalayan glaciers, surging glaciers and iceberg calving.

Among the most valued and impactful contributions to the community is the comprehensive textbook *Glaciers and Glaciation*, co-authored with David Evans. Dr Benn's ability to observe, then synthesize a topic and find underlying and unifying principles distinguishes him in the field of glaciology.

Dr Benn's approach to glaciological problems integrates diverse data, including field data, to identify key principles and processes. For example, his recent work on surges sought an underlying principle to explain the diverse behaviour of surging glaciers based on their mass and enthalpy budgets. A similar approach infuses Dr Benn's pioneering work in iceberg calving. Seeking to bridge the divide between increasingly computationally focused fracture mechanics and empirical calving laws, Dr Benn introduced a new calving law based on longitudinal strain rates. His insight into these problems has been so powerful in part because of his ability to entrain collaborators with different skill sets. The calving law Dr Benn developed was easily ingested into flowline models and was adopted almost immediately, providing some of the first physically based estimates of Greenland glacier retreat.

Similarly, Dr Benn fostered collaborations with computational geoscientists to develop the Helsinki Discrete Element Model, a state-of-the-art model that provides stunningly realistic fracture patterns. This work is a platform for exploring the mechanisms and rates behind the controversial marine ice-cliff instability and the influence of ocean forcing on glacier stability.

In addition to Dr Benn's direct contributions to the field, he has been an effective and valued mentor to numerous early-career researchers. Through graduate supervision and leadership of the advanced glaciology courses at UNIS he has instilled an infectious passion and enthusiasm for the field of glaciology in his students. Dr Benn's enthusiastic inquisitiveness, ability to see to the heart of a problem and willingness to identify and pursue unorthodox approaches has led to transformational innovations across multiple areas of glaciology.

On behalf of the Awards Committee of the International Glaciological Society
Jeremy Bassis, Chair

Seligman Crystal for Yao Tandong

Dr Yao Tandong (Institute of Tibetan Plateau Research, Chinese Academy of Sciences) has played a leading role in the international community in the field of climate and ice-core research. He has initiated foundational work in Tibetan Plateau climate reconstruction from ice cores and glacier fluctuations, as well as research in environmental change and its impact on the Tibetan Plateau and surrounding regions.

One of Dr Yao's most influential areas of research has been his exceptional contributions that advanced understanding of the response of glaciers to climate change on the Tibetan Plateau and the surrounding regions. His pioneering work includes interpretation of stable isotopes of oxygen and hydrogen in ice cores and precipitation across the Tibetan Plateau. For example, Dr Yao initiated in-situ glacier mass-balance measurements on the Tibetan Plateau that provide unprecedented information about the heterogeneity of mass changes in the region. He also demonstrated that a significant relationship exists between these isotopes in precipitation collected across the northern Tibetan Plateau and air temperature, one of the first such correlations established outside the polar regions.

He further identified abrupt climatic changes in this tropical–subtropical region on different timescales, including transitions from glacial to interglacial stages.

Dr Yao's contributions include influential leadership in conducting innovative and cross-disciplinary pioneering research by organizing international groups: he was the founder of the Institute of Tibetan Plateau Research (ITP), Chinese Academy of Sciences, in the 2000s, has served as the Director of the institute for the past 15 years and has served as co-chair of the Third Pole Environment program since 2009, addressing 'water–ice–air–vegetation–rock (soil)–human' interactions in the Third Pole region.

Dr Yao's remarkable contributions to the fields of glaciology, climatology and environmental change across the Third Pole have been invaluable in assessing the impacts of the recent anthropogenic influences in this critical, but historically understudied region. Dr Yao has played a seminal role in bringing international attention to what remains one of the most difficult to access and least studied regions of the world.

On behalf of the Awards Committee of the International Glaciological Society
Jeremy Bassis, Chair

Richardson Medal for Tavi Murray

Dr Tavi Murray (University of Swansea, UK) has research interests that permeate all aspects of glacier dynamics with significant contributions to our understanding of surging and tidewater glaciers.

She is also an expert field and observational scientist, having led over 25 field seasons in glacierized regions including Greenland, Antarctica, the Arctic and the Alps. With these efforts, Dr Murray has played a pivotal leadership role in the glaciological community locally, regionally and internationally over the past two decades.

Dr Murray's contributions include roles as a member of the International Glaciological Society Council (1992–2002), Vice-President (2001–03) and President (2003–05) of the IGS British Branch, Chair of the NERC Geophysical Equipment Facility Steering Committee (2003–06), member (2002–04), President (2015–17) and Past-President (2017/18) of the AGU Cryosphere Science Executive Committee, member of the Science Advisory Council for Wales (2010–present) and Expert Reviewer (2005/06) and Lead Author (2010–14) for the IPCC.

Dr Murray played a central role in the creation and growth of the AGU Cryosphere section, which now stands as a thousand-strong community.

Dr Murray also established the IGS Global Seminar Series in 2020, which continues to this day with over 900 subscribers to the IGS YouTube channel. This virtual IGS seminar series provided a key forum to keep our community together during the extremely trying and isolating times of the pandemic.

Dr Murray has been a strong advocate for promoting public understanding of science, widening engagement in science and establishing positive research cultures within our discipline. She is a passionate communicator, regularly writing popular

science articles and frequently participating in lectures, talks and outreach events with community groups, school children, policy makers and scientific bodies. For example, the public exhibits on the Greenland Ice Sheet that she has hosted at the National and Youth Eisteddfods and the Royal Society Summer Science Exhibition reached tens of thousands of people.

Through her scientific and community leadership, Dr Murray has provided a strong, positive role model for glaciologists over three decades. Through her research, mentoring and community service, she has inspired young scientists, especially girls, women and members of under-represented minority groups, to work on environmental issues and climate change, thereby broadening the pool of talent dedicated to these important problems.

On behalf of the Awards Committee of the International Glaciological Society
Jeremy Bassis, Chair

Early Career Scientist award for Pat Wongpan

Dr Pat Wongpan is an emerging leader in the sea-ice community. Dr Wongpan's research focuses on the physical, biogeochemical and ecological significance of Antarctic sea ice. His graduate work used field observation, laboratory experiments and computer simulation to study the structure of the porous bottom layer of landfast sea ice and its role as a biological habitat. His findings improved understanding of not only the physical properties of landfast sea ice but also its biogeochemical role in the Antarctic ecological system.

His research interests have since broadened to consider the impact of glacial meltwater on the spatial variability of sea-ice algal biomass, the role of snow processes on nutrient redistribution in sea ice, and the impact of climate change on sea-ice ecosystems and biogeochemistry. He was also instrumental in the publication of the first review of Antarctic fast ice, working with 21 experts from 11 different institutions across six countries, demonstrating his excellent record of international collaboration.

Dr Wongpan's work is impressively multidisciplinary, with publications ranging from crystallography and platelet layer physics to measurements of sea-ice nutrient distributions and algal biomass. He strives to incorporate his research experience into public outreach. For example, his community outreach in Thailand, Japan and New Zealand involves educating groups from diverse backgrounds, from elementary students through to high-school teachers, to better understand the Earth–Ocean system.

He has expanded his outreach activities to the next generation of polar scientists by serving as the founder and coordinator of the Frontiers for Young Minds' Antarctica and the Southern Ocean Collection. This organization aims to digest cutting-edge science for young readers to increase their understanding of Antarctica and its central role as a global climate driver.

Dr Wongpan also represented Thailand at the Asian Forum for Polar Sciences (AFOPS) at the Scientific Committee on Antarctic Research (SCAR) meeting in 2016, and has been a passionate advocate for the need to involve more diverse groups in polar research.

On behalf of the Awards Committee of the International Glaciological Society
Jeremy Bassis, Chair

Firn Award for David Rounce

Dr Rounce has emerged as a leader in the glaciological community with multi-faceted skills that include numerical modeling, field work, remote sensing and data analysis applied to glacier change and associated hazards at all scales.

Dr Rounce's initial work focussed on debris-covered glaciers in the Himalayas, with a particular emphasis on modelling energy exchanges between the ice and atmosphere through the supraglacial debris layer. He used this approach to develop a novel inversion of glacier surface temperature to derive spatially distributed maps of supraglacial debris thickness for the Everest region of Nepal, paving the way for systematically capturing the insulating properties of a debris layer in glacier mass-balance models. This approach was scaled to derive the first distributed debris-thickness map of all glaciers in the world outside the ice sheets.

Dr Rounce's most significant contribution to glaciology to date, however, is his work developing models of glacier evolution on a global scale. Dr Rounce developed a new physics-based global glacier evolution model (PyGEM), and importantly made this model open access with the aim of it becoming a community resource. Dr Rounce used this model to produce the most comprehensive projections of global glacier mass changes under plausible climate-change scenarios.

In addition to his outstanding science contributions, D. Rounce is deeply dedicated to international professional service, outreach activities, public engagement and mentoring. He is a Scientific Editor for Journal of Glaciology, has served as a guest editor for two other journals, including the Annals of Glaciology, and contributes to several international working groups, including the

Randolph Glacier Inventory and the global Glacier Model Intercomparison Project (GlacierMIP).

He has also taken on leadership roles within the international community, including as co-chair of the International Association of Cryospheric Sciences (IACS) Working Group on Debris-Covered Glaciers.

Dr Rounce has demonstrated a strong commitment to advising and mentoring, including building networks to provide opportunities for the students he supports. Dr Rounce has emerged as a scientific leader in the glaciological community, whose research and service exhibit the IGS core values of respect, integrity, inclusivity, innovation and collaboration

On behalf of the Awards Committee of the International Glaciological Society
Jeremy Bassis, Chair

Obituary: Chris Borstad, 1978–2023

A Life Lived to the Fullest

Our dear friend and colleague Chris Borstad died on 15 November 2023 in Billings, Montana, USA. He was only 45 years old.

Christopher Paul Borstad, born on 11 April 1978 in Sheboygan, Wisconsin, USA, was named after two of his great grandfathers. Chris grew up in Fort Collins, Colorado, with his parents Ted and Beverly (Meyer) and two younger sisters Abbey and Stacey. He was active in many sports growing up and developed a love of the outdoors at an early age. He graduated from Rocky Mountain High School in 1996. Highlights of his early outdoor pursuits include wilderness canoe trips with his dad, riding his bicycle across the United States, a season working at Beaver Creek ski area, and backpacking through Europe. He became an uncle to three adoring girls who he taught to swim, ride bikes, and love nature. Through much of Chris's adult life, he was accompanied by his beloved rescue dog Jed who joined him on every adventure possible.

After finishing an undergraduate degree in Physics/Maths in 2002 at Colorado State University Fort Collins, Chris entered the world of ice and snow, undertaking a Masters (2005) studying the dynamics of extreme avalanches followed by a Ph.D. (2011) investigating fracture and damage mechanics of dry snow slab avalanches, both at UBC's Department of Civil Engineering in Canada. Appropriately, Chris's career was launched with a prestigious position as a NASA Postdoctoral Program Fellow at the Jet Propulsion Laboratory followed by a Caltech Postdoctoral Scholar position at the California Institute of Technology. Here, he began his work developing methods for parameterizing ice shelf damage, laying

the foundation for model representation of damage-related calving and ice-shelf breakup, which resulted in a set of manuscripts that are highly-regarded by the cryosphere community.

In the long term, however, Los Angeles was not for Chris. When a position came up in Arctic Geophysics at the University Centre in Svalbard (UNIS), Norway, he pounced. After spending 5 years at nearly 80°N in the Arctic wilderness, he accepted his dream job in the Department of Civil Engineering at Montana State University, Bozeman. Back in the mountains that he loved and seemingly unstoppable, a year later Chris's life and career came to an abrupt halt after a seizure in March 2020 that led to a brain cancer diagnosis shortly thereafter. A semi-hemispheric stroke during surgery, which paralyzed the left half of his body, was no match for Chris. Within months, he was back to cutting the grass and shoveling the driveway. While his new physical challenges

kept back country skiing, long distance cycling, and remote fieldwork beyond his reach, Chris's perseverance got him back on a bike, out trekking with his dog, Nansen, and even on downhill skis.

After another seizure in May 2023, Chris enjoyed one last summer with Nansen at his home in Bozeman, Montana, which he loved. He passed away peacefully on November 15, 2023 in Billings after an almost 4 year battle with brain cancer and complications from a fall in the preceding weeks.

Those who knew Chris will tell you that he was a remarkable guy who was loved by everyone he met. He was brilliant, had the best sense of humour, and an exuberant enjoyment of life. Anyone who has been stuck in close quarters during a spell of inclement weather in the field can attest to the fact that there's no one better with whom to share such conditions. The loss of Chris from the cryosphere community was tragedy enough, but now we're left to deal with the huge unfillable void that Chris has left behind. He was dealt a bad hand in the end, but he made the best of every day and fought hard to recover as best he could. Chris leaves behind many friends and his family who miss him deeply: his parents Ted and Beverly Borstad, his sisters Abbey (Borstad) and Chad Biehl and Stacey Borstad and Sherwood Webber, and his beloved nieces, Dagny, Leni and Bo, and of course his dog Nansen.

Timothy James and other friends of Chris

INTERNATIONAL GLACIOLOGICAL SOCIETY

International Symposium on

Verification and Validation of Cryospheric Models

– Bringing Data and Models Together –

Newcastle, UK
4–9 August 2024

FIRST CIRCULAR
October 2023
https://www.igsoc.org/event/northumbria_2024

The International Glaciological Society (IGS) will hold an International Symposium on Verification and Validation of Cryospheric Models in Newcastle, UK, from 4–9 August 2024. Registration will begin in late April 2024.

THEME

Cryospheric models that simulate land and sea ice dynamics, snow physics and permafrost processes have become mainstream tools to assess the past, present and future state of the Earth's frozen landscapes. In combination with observational data, they provide a powerful, physics-constrained method to address some of Earth Science's most pressing questions. They form the backbone of sea-level rise projections, they underpin freshwater budget estimates of the world's glaciated mountain regions and oceans, and they are dynamically integrated with other components of the global climate system. The continued development, calibration and validation of cryospheric models should therefore remain at the forefront of ongoing research. This symposium will invite contributions by the international research community on a wide range of topics in the field of cryospheric model verification and validation, covering a range of different length and timescales. We invite contributions relating to numerical model developments, process-based studies, and/or novel observational products. The focus of the symposium will be on improving numerical models and their interactions with the climate system, although cross-cutting interdisciplinary contributions are invited from a range of topics, as detailed below.

TOPICS

We seek papers and presentations on any timely topic related to the verification and validation of numerical models that simulate the cryosphere. All contributions may include and/or combine observational, numerical, theoretical, laboratory or conceptual approaches. Key focus areas include (but are not limited to):

1. **Ice sheets and ice shelves:** observations and modelling of ice dynamics, basal and surface mass balance, with reference to past, present-day and/or future change
2. **Mountain glaciers and ice caps:** advances in numerical simulations of glacier mass balance at local to global scales, new datasets for validation and calibration, and numerical assessments of cryospheric hazards
3. **Snow and firn processes:** advances in numerical simulations and integration with novel observational datasets of firn processes, snow cover, snowpack properties and interactions with the climate system
4. **Permafrost:** initialization and validation of thermal models, advances in the coupling to land surface schemes and GCMs
5. **Sea ice:** advances in sea-ice physics and models, novel datasets and integration with coupled Earth-System models
6. **Cryosphere–climate interactions:** feedbacks, attribution, tipping points

7. **Advances in data-driven model initialization and calibration:** machine learning, emulators, uncertainty quantification
8. **Model verification and model intercomparisons:** benchmark datasets, including lab measurements, and analytical approaches
9. **Future perspectives:** the impact of model initialization, data gaps, data errors, under-constrained or missing physics

In the preparation of the conference we will invite more specific proposals for sessions related to one or several of the topics above.

PROGRAMME

The symposium will include oral and poster sessions and will be a friendly and intellectually stimulating environment to facilitate face-to-face interactions and networking. Additional activities will include an opening Icebreaker reception, a banquet dinner, a mid-symposium afternoon excursion and pre/post symposium excursions.

ABSTRACT AND PAPER PUBLICATION

Participants who wish to present a paper (oral or poster) at the Symposium will be required to submit an abstract. Accepted abstracts will be posted on the Symposium's website. The Council of the IGS has decided to publish a thematic issue of the *Annals of Glaciology* on topics consistent with the Symposium themes. Participants and non-participants alike are encouraged to submit manuscripts for this *Annals* volume. A call for abstracts will be issued in the Second Circular.

SIDE MEETINGS

There will be an opportunity for breakout meetings relating to the broad symposium theme. Email jan.rydt@northumbria.ac.uk to discuss.

VENUE

The symposium will take place on the campus of Northumbria University, located in the city centre of Newcastle, UK.

SYMPOSIUM ORGANIZATION
Magnús Már Magnússon (International Glaciological Society)

LOCAL ORGANIZING COMMITTEE
Jan De Rydt, Lindsay Connolly

SCIENCE STEERING COMMITTEE*
Hilmar Gudmundsson (U. Northumbria, chair), Guðfinna Aðalgeirsdóttir (U. Iceland), Rachel Carr (Newcastle U.), Christine Hvidberg (U. Copenhagen), Adrian Jenkins (U. Northumbria), Ching-Yao Lai (Stanford U.), Brent Minchew (MIT), Ruth Mottram (Danish Met. Inst.), Frank Pattyn (Free U. Brussels), Andy Shepherd (U. Northumbria), Ted Scambos (U. Colorado), Jürg Schweizer (SLF Davos), John Woodward (U. Northumbria)

EDITORIAL COMMITTEE*
Hester Jiskoot, Chief Editor; Rachel Carr, Associate Chief Editor; Scientific Editors TBC

FURTHER INFORMATION
If you wish to receive future communications from IGS and the local organizing committee about the Symposium, please **register your interest online** at https://community.igsoc.org/events/651af4328556cb0008d21b64/description

The Second Circular will give further information about accommodation, the scientific programme, additional activities, preparation of abstracts and final papers. Members of the International Glaciological Society, as well as all those who have expressed an interest, will automatically receive notification of the Second Circular.

Information will also be updated on the IGS conference website, https://www.igsoc.org/event/northumbria_2024 and the local website, https://www.northumbria.ac.uk/about-us/news-events/events/2024/08/igs-symposium-aug-2024/, as it becomes available.

*Additional members of the Science Steering committee and members of the Editorial committee will be added after publication of the first circular

Glaciological diary

** IGS sponsored * IGS co-sponsored

2023

4–6 October 2023
Polar CORDEX 2023
Utrecht, Netherlands
Website: https://climate-cryosphere.org/2023-polar-cordex-annual-meeting/

10–12 October 2023
Workshop on subglacial and englacial hydrology and geology
Tarraleah, Tasmania Australia
Website: https://antarctic.org.au/

20–21 October 2023
NorthWest Glaciologists Meeting
Seattle, Washington, USA
Contact: Michelle Koutnik

31 October–1 November 2023
Svalbard Science Conference 2023
Oslo, Norway
Website: https://forskningsradet.pameldingssystem.no/svalbard-science-conference-3

6–7 November 2023
Elmer/Ice Beginner Course
Espoo, Finland
Website: https://ssl.eventilla.com/elmericebeginner

8–10 November 2023
IGS Nordic Branch meeting, 2023
Ottaniemi, Finland
Contact: Thomas Zwinger

9–10 November 2023
International Conference on Mountain Hydrology and Cryosphere
Kathmandu and Dhulikhel Nepal
Website: https://antarctic.org.au/

14–17 November 2023
14th Symposium on Polar Science
Tokyo, Japan
Website: https://www.nipr.ac.jp/symposium2023

14–17 November 2023
International Symposium on Third Pole Environment
Chongqing, China
Website: http://www.tpe.ac.cn/

2024

29 January–1 February 2024
Arctic Frontiers: Actions and Reactions
Tromsø, Norway
Website: https://arcticfrontiers.com/2024-action-reaction/

30 January–2 February 2024
4th International Conference on Snow Hydrology
Grenoble, France
Website: https://snowhydro2024.sciencesconf.org

14–16 February 2024
2024 Snow and Ice Research Group (SIRG) Workshop New Zealand
Central Otago, New Zealand
Website: https://www.igsoc.org/event/2024-snow-and-ice-research-group-sirg-workshop-new-zealand

11–12 March 2024
ICE-D Workshop
Amherst, Massachusetts, USA
Website: https://wiki.ice-d.org/workshops:umass

14–15 March 2024
27th Alpine Glaciology Meeting
Grenoble, France
Website: https://agm2024.sciencesconf.org/

25–28 March 2024
Data Management Course with Arctic Data Center
Santa Barbara, California, USA

18–19 April 2024
Northeast Glaciology Meeting (IGS Northeastern North American Branch)
Cambridge, Massachussetts, ISA
https://www.igsoc.org/event/northeast-glaciology-meeting-igs-northeastern-north-american-branch

22–25 April 2024
91st Annual Western Snow Conference
Corvallis, Oregon, USA
Website: https://www.westernsnowconference.org

25 April 2024
3rd Annual Colorado Glaciology Workshop
Boulder, Colorado, USA

15–17 Mayl 2024
US Ice Core Open Science Meeting
Portland, Oregonn, USA
Website: hhttps://herculesdome.org/us-ice-core-open-science-meeting-2024

22–31 May 2024
24th Karthaus Summer School: Ice sheets and glaciers in the climate system
Karthaus, Italy
Website: https://www.projects.science.uu.nl/iceclimate/karthaus/

28 May–3 June 2024
Arctic Congress 2024
Bodø, Norway
Website: https://www.arcticcongress.com/

3–14 June 2024
Cryospheric Modelling
Sapporo, Japan
Website: https://hokkaidosummerinstitute.oia.hokudai.ac.jp/en/courses/CourseDetail=G083

7–17 June 2024
7th International Alaska Summer School in Glaciology
McCarthy, Alaska, USA
Website: https://glacierschool.alaska.edu/

10–14 June 2024
19th Workshop on Antarctic Meteorology and Climate/8th YOPP-SH Meeting
Columbus, Ohio, USA
Website: https://polarmet.osu.edu/WAMC_2024/

16–20 June 2024
2024 International Conference on Permafrost (ICOP2024)
Whitehorse, Yukon Territory, Canada
Website: https://event.fourwaves.com/999e4551-2c44-4e79-8ee8-98270952a41f/pages

19–21 June 2024
37th Forum for Research into Ice Shelf Processes (FRISP 2024)
Bremerhaven, Germany
Website: https://scar.org/scar-news/physical-sciences/frisp-news/frisp-37th-forum-report

22–31 July 2024
Summer School and Workshop on Polar Climates
Trieste, Italy
Website: https://iasc.info/events/85-summer-school-and-workshop-on-polar-climates-theoretical-observational-and-modelling-advances

4–9 August 2024
****International symposium on Verification and Validation of Cryospheric models**
Northumbria University, Newcastle, UK
Contacts: Secretary General, International Glaciological Society (IGS); Jan De Rydt <jan.rydt@northumbria.ac.uk>

14–15 August 2024
NASA Community Snow Meeting
Boulder, Colorado, USA
Website: https://snow.nasa.gov/events/nasa-community-snow-meeting

19–23 August 2024
11th SCAR Open Science Conference
Pucón, Chile
Website: https://www.scar2024.org

26–30 August 2024
OGGM: IGM Glacier Modeling Workshop 2024
Chateau d'Œx, Switzerland
Website: https://oggm.org/2024/01/19/8th-workshop-announcement/

2–2 September 2024
IGS British Branch Meeting 2024
Liverpool, UK
Website: https://www.igsoc.org/about/branches/british-branch-uk

6–12 September 2024
3rd Machine Learning in Glaciology
Finse Research Station, Norway
Website: https://machine-learning-in-glaciology-workshop.github.io

9–20 September 2024
GRISO 2024 Summer School
Nuuk, Greenland
Website: https://griso.ucsd.edu/griso-summer-school-2024/

16–20 September 2024
29th International Polar Conference
Rauris, Austria
Website: https://polarforschung.de/events/29-intl-polartagung-rauris-2024/?lang=en

22–28 September 2024
Innsbruck Summer School of Alpine Research 2024
Obergurgl, Austria
Website: https://www.uibk.ac.at/en/geography/sensing-mountains/2024/

23–27 September 2024
Ice Core Analysis and Techniques (ICAT)
Copenhagen, Denmark
Website: https://indico.nbi.ku.dk/event/2040/

25–27 September 2024
International Symposium on Geomatics, Remote Sensing, and Climate Change in the Arctic, Antarctica, and High Mountain Asia
Tongji, China
Website: https://TriPolar-RS.tongji.edu.cn

11–12 October 2024
Northwest Glaciologists Meeting 2024
Fairbanks, Alaska, USA
Website: Northwest Glaciologists Meeting 2024

30 October–1 November 2024
IGS Nordic Branch meeting 2024
Hellissandur Iceland
Website: https://www.igsoc.org/about/branches/nordic-branch

5–7 November 2024
12th International Workshop on Sea Ice Modelling, Assimilation, Observations, Predictions and Verification (aka IICWG-DA-12)
Frascati, Italy
Website: https://nikal.eventsair.com/iicwg---da---12-workshop-2024/

2025

27–28 February 2025
28th Alpine Glaciology Meeting
Innsbruck, Austria
Website: https://icedrill.org/upcoming-events

20–25 July 2025
****International symposium on Ice Streams and Outlet Glaciers**
Durham, UK
Contact: Secretary General, International Glaciological Society (IGS)

20–25 July 2025
IAMAS-IACS-IAPSO BACO-25 Joint Assembly
Busan, South Korea

14–19 September 2025
****International symposium on Ice Drilling Technology**
Bremen, Germany
Contact: Secretary General, International Glaciological Society (IGS)

2026

21–26 June 2026
****International symposium on Artificial Intelligence in Glaciology**
Hanover, New Hampshire or Baltimore Maryland, USA,
Contact: Secretary General, International Glaciological Society (IGS)

5–10 July 2026
****International symposium on Interactions of Ice Sheets and Glaciers with the Ocean**
La Jolla, California, USA
Contact: Secretary General, International Glaciological Society (IGS)

6–11 September 2026
****International symposium on Radioglaciology**
Tübingen, Germany
Contact: Secretary General, International Glaciological Society (IGS)

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