

ICESHEET

The British Antarctic Survey Internal Newsletter



Jan-Feb 18
#94

All Change In April

Director's Office

The beginning of April is a time of change in two ways. Firstly, organisation of research will change with the launch of UKRI (UK Research and Innovation), which brings together the seven Research

Councils, Innovate UK and Research England. This new



structure will encourage cross-disciplinary research and innovation to promote the UK as a global leader in research, funded with a budget of more than £6 billion.

BAS will remain within NERC but all BAS staff will transfer to become employees of UKRI, and assets such as aircraft, ships and vehicles will also transfer. The structures within

NERC in this new world are still being developed but in BAS our mission in the polar regions will remain the same, while also taking advantage of the new multidisciplinary programmes.

Secondly, the current contract for catering in the Icebreaker restaurant has come to an end. We owe so much to Russ and his team for their dedication

over the past few years. The food has been special, the menu wonderfully varied, and the service so friendly. They also rose to the challenge of feeding the growing numbers of external customers of the new conference facilities with exceptional feasts that truly impressed visitors. A heartfelt thanks from us all to Russ and his team.

Professor Dame Jane Francis

BAS Staff Awarded Polar Medals

BAS honours



▲ Mark Beasley

Many congratulations to three BAS staff who have been awarded the Polar Medal in the New Year's Honours List, and one who has been awarded a prestigious Second Clasp. The announcement was made in the London Gazette.

Captain Mark Beasley, Antarctic Pilot and Training Captain, receives the Polar Medal in recognition of his work flying specialist aircraft in support of polar science in Antarctica.



▲ Kevin Newsham

Polar Soil Biologist Dr Kevin Newsham joined BAS in 1997 and specialises in soil fungi and nutrient cycling. His Polar Medal is awarded for his work in the Polar Regions which draws on 25 years of research in soil and plant ecology. Kevin studies the influence of environmental change on soil microbes and plants in Arctic and Antarctic ecosystems.

James Wake has worked at BAS since 2007 and his roles have included Field Guide,



▲ James Wake

Station Leader and Traverse Leader for the iSTAR tractor traverse. His Polar Medal is awarded for his management of complex operational challenges in Antarctica.

Nick Cox received a Second Clasp to his Polar Medal. Nick has worked at BAS for over 40 years and was awarded his first Polar Medal in 1993. The second clasp highlights his continued service developing



▲ Nick Cox

an international research community at the UK's Arctic Ny-Ålesund Research Station, where he has worked as Station Leader since it was established in 1991.

The Polar Medal is awarded by HM The Queen to personnel who have given valued service in the Polar Regions. Congratulations to all.

– Layla Batchellier



British Antarctic Survey
NATURAL ENVIRONMENTAL RESEARCH COUNCIL

12-PAGE EDITION

Student Paper AGU Award

BAS PhD student Hayley Allison has won the outstanding student paper award for her poster at the Fall AGU in New Orleans. The Fall AGU is the foremost meeting in our field of geophysics where the best scientists from around the world attend each year. The student paper competition is highly competitive and for Hayley to have won this award is recognition of her abilities in an international context. Many congratulations Hayley!

– Richard Horne



▲ Hayley Allison – winner

Director Of Operations Update

This season has continued at a frenetic pace after a turbulent start – busy seems to be the new norm. Across every area we've been pushed hard. Preparing for the future has added to the pressure, as demand from project work increases. We are trying to moderate the load, including finding better ways of working but I appreciate that looks a little like 'jam tomorrow'. I'm confident that we will get there, so ask that you bear with us as we transition to our new operating dynamic (see *article below*).

There have been some significant successes along the way. Bird Island construction project has started. Halley was successfully recommissioned and winterised. KEP hosted a range of visitors during a busy fishing season. Signy was dug out from the ice and opened

on time. Ships and aircraft have been hard at work, overcoming the vagaries of the weather and serviceability. Rothera has enabled a deep field season and it will never be the same again – redevelopment starts next season. RRS SDA is on track to launch this year.

With so much going on it's easy to lose sight of our overriding aim of safe operations. We are building systems that will support this goal but they are no good without people. So please take a few minutes to think and reflect when you can. It needs all of us working together to deliver BAS science and logistics safely.

Thank you for your support and hard work this season – I wish you every success and a safe return home.

– Tim Stockings

BBC Horizon Award Shortlist

BBC Horizon documentary 'Antarctica – Ice Station Rescue', which followed the Halley VI relocation, was nominated for 'best documentary programme' in the prestigious 2018 Broadcast Television Awards in February.

The programme didn't win but Blue Planet II, which featured footage from Bird Island and interviews with BAS Marine Ecologist Lucy Quinn, did scoop the top prize for 'best documentary series'.

– Athena Dinar



▲ Filming at Halley in 2017

Plant And Soil Succession On SG

As part of an ongoing NERC-CONICYT award, this season an international group of researchers spent two months conducting fieldwork at Husvik, South Georgia, on successions of plants, microbes and soils in a receding glacier foreland. The foreland, previously studied by former BAS botanist Ron Lewis-Smith in the 1980s and '90s, consists of a well-defined set of moraines spanning nearly a century. By revisiting the site we hoped to gain invaluable insights into the way in which polar terrestrial ecosystems develop over time. As well as repeating observations made

on the plant community by Ron, we included a strong biogeochemical angle, aiming to quantify and scale changes and rates in both biological and geochemical succession, including trace gas fluxes between soils and atmosphere after glacial retreat.

We had a young (three postdocs, a PhD student and a MSc student) and productive field team, consisting of staff at institutes across Europe and South America. Living amongst a fur seal colony was also an experience never to forget! Thanks to all involved.

– Elise Biersma



▲ The researchers spent two months at Husvik on South Georgia

New Operating Dynamic For BAS

With the introduction of RRS *Sir David Attenborough*, the way BAS operates is going to change significantly. In order to understand what the future operating model looks like, we need to develop a New Operating Dynamic.

My role is to analyse current and future operating models to ensure that project benefits are realised and that we continue to deliver world-class science. This will involve looking at our science commitments alongside our logistical requirements and identify solutions where problems may exist.

There are a number of potential 'Plus Options' and it is my job to analyse them to determine the best fit for the future. I'm looking forward to using my experience from the Navy and in commercial shipping to help BAS find solutions moving from a two-



▲ Amie Jackson

ship to one-ship operation. We also have the opportunity here to revitalise the way we do business and in order to do that, it will need input from every element of BAS.

If you have ideas, questions, concerns or solutions then please come and talk to me so I can factor them into the planning. You can usually find me in Room 121 or with a cup of tea in my hand in the Icebreaker.

– Amie Jackson

Bird Island Beck House Update



▲ Celebrating the setting of the first foundation pad – only 54 to go!

After a year of planning, the first of the Antarctic Infrastructure Modernisation Projects (AIMP) has started. In partnership with BAM Nuttall, a construction team of 10 left the UK in mid-January and spent the next two weeks biosecuring all construction materials at Mare Harbour on the Falkland Islands ready for collection by RRS *Ernest Shackleton*. On 3rd February the ship set sail with an additional three BAS Project Management and support staff.

Once at Bird Island, cargo works started and between 6th and 17th February, 73 loads of materials were delivered by tender to the station. During this time three days were lost to weather but this allowed us to install and commission the temporary accommodation that the project team will use throughout the project.

After first call the *Shackleton* left Bird Island, so with help from the BAS team Beck

BAS stations

House was cleared of all equipment which will be stored in Weatherhaven tents for the next four months. The old building was demolished and materials packaged ready for collection. We have now started ground works and hope to have the building constructed and watertight over the coming weeks.

A big thanks to the crew of the *Shackleton* and the BAS team at Bird Island for helping ensure we have had a flying start to the project.

– Joe Corner



▲ The new bulk fuel tanks

Wassailing In BAS Orchard

On 17th January, twelfth night in the old Julian calendar, BAS staff enjoyed the old English tradition of wassailing to bless the coming year's crop. We were led by Paul Ward (BAS Club volunteer maintaining the fruit trees). Paul spent just over two years in Antarctica from 1985-87 as a marine biologist at Signy. Paul recited a traditional poem as we circled the largest apple tree, banged sticks to ward off evil spirits and put apple-juice soaked toast in the boughs. We may juice the apple crop this year.

– Jo Rae



▲ Begone evil tree spirits!

Mike Meredith Medal Winner

Congratulations to BAS Science Leader Mike Meredith, who has been awarded the Challenger Medal for 2018. The Challenger Society is the foremost learned society representing the UK academic marine research community.

The Challenger Medal is awarded to a distinguished UK marine scientist who has made a significant contribution to marine science. Mike will present the Challenger Medal Lecture at the society's annual meeting in Newcastle later this year. Well done Mike!

– Jane Francis



▲ Prof Mike Meredith

BAS Ice Drill Breaks Record



▲ The record-breaking RAID

The BAS RAID (Rapid Access Isotope Drill) was designed to penetrate ice rapidly and, rather than recovering an ice core, it recovers ice chips which can be used to measure water isotopes and build a climate record. The drill uses an auger inside a barrel to drill ice, and when returned to the surface after each run of about 1.3m, the auger is rotated backwards to empty the barrel of ice chips which can then be sampled for later analysis. During the recent field

work at Little Dome C with Italian and French colleagues, Julius Rix and Robert Mulvaney drilled to 461m with the RAID. This is a new record for a mechanical ice drill in a dry borehole – the previous record was held by the US Polar Ice Core Office with a 353m deep dry borehole at South Pole in 1984.

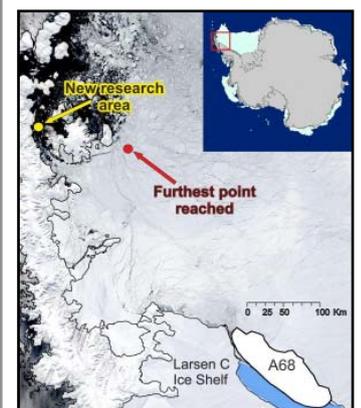
Sadly, at the depth of 461m, the RAID auger became stuck, and could not be freed. Nevertheless, drilling to this depth samples ice back about 19,000 years (into the last glacial period), and left a borehole in which the ice temperature can be measured with sufficient precision to estimate local geothermal heat flow. These results will help determine if the glaciological ice-sheet models are credible in predicting ice as old as 1.5 million years near the bed at this location (see page 4).

– Rob Mulvaney

Larsen C Cruise Plan Thwarted

Heavy sea ice thwarted the Larsen C science mission from reaching the area recently vacated by the A68 iceberg. The JCR turned back with 4-5m thick ice blocking their path. All was not lost however, as the international science team implemented Plan B and headed to Prince Gustav Channel (where the ice shelf collapsed in 1995) to study biodiversity on the seabed.

– Athena Dinar



▲ The ice was up to 5m thick

Polar Explorers In Scotland

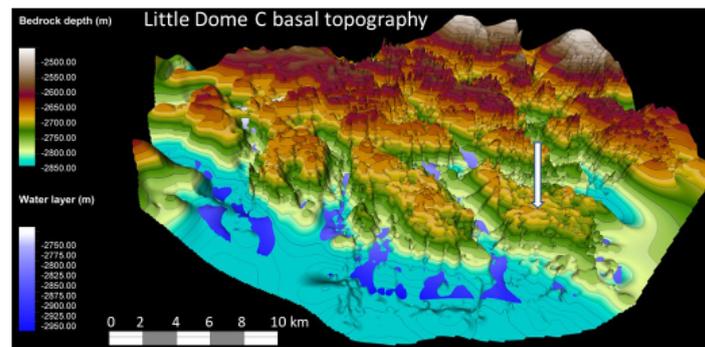
On 16th February, Polar Explorers Elaine Fitzcharles and Hilary Blagbrough visited the Ninth Dumfries (Lockerbie) Scouts Group (cubs section) to take a taste of Antarctica to the chilly north. Interesting facts about Antarctic life included how many cubs it takes to show the wingspan of a wandering albatross. One willing volunteer was dressed up in exploration clothing before everyone else had a chance to investigate the clothing, food, beasts and fossils on display.

– Hilary Blagbrough



▲ Antarctica comes to Dumfries

The Search For The Oldest Ice



▲ An area 18x12km was scanned using an over-snow radar system

In Nov/Dec 2017, Robert Mulvaney and Julius Rix joined colleagues from Italy and France at a field site about 40km from Concordia Station in East Antarctica. Our goal was to find a site for a European project (Beyond EPICA – Oldest Ice) that hopes to drill a deep ice core to obtain the longest continuous record of greenhouse gases and climate.

Glaciological models have indicated that the area known

as Little Dome C might have ice as old as 1.5 million years about 60m above the bedrock – substantially older than the 800,000 years recovered at the original EPICA site at Dome C. The challenge for this season was to find the site for the future drilling infrastructure.

Using the BAS DELORES over-snow radar system, over 2,000km of close-spaced, crisscrossing radar lines over an area 18x12km allowed us

BAS science

to build a picture of the basal topography in the Little Dome C area. The ice-sheet bed varies between 2,500-2,850m depth in the ice, and is a flat plateau incised with 300m deep valleys, with evidence that the deepest valleys may have melting at the bottom.

A site was chosen for future deep drilling on a small plateau with an ice depth of 2,700m, and the team drilled the first pilot borehole in readiness for further work next season.

– Rob Mulvaney



▲ The EPICA site at Dome C

Bubba The Skua Missing In Action

Many of us who have visited Rothera during the summer months will be familiar with the sight of a slightly different looking skua with a cheeky demeanour known to all as 'Bubba'. Bubba is a brown skua and as such is slightly larger than the resident south polar skuas which breed on Rothera Point. He was ringed as a chick



▲ Bubba was last seen in 2015

at Palmer station on 17th February 1981, first appearing at Rothera in 1989 and has since returned to Rothera each summer season, flying north for the winters. Rothera is close to the southernmost limit for brown skuas and Bubba is the only brown skua which has been sighted there.

According to Wikipedia a study in 2016 indicated that brown skuas can recognise individual humans and Bubba certainly took a liking to Clem (the Air Unit GA and one of Rothera's longest-serving FIDs); he could often be found following Clem around the hangar and apron or patiently waiting for him on the handrail outside New Bransfield House. Bubba was well-liked on station and gained numerous friends when he created his own Facebook page in 2013!

Bubba was last seen at Rothera in April 2015 and

BAS stations



▲ Rothera Research Station

sadly has not returned since. A recent conversation with Richard Phillips led to a series of emails to the Bird Banding Laboratory in America which keeps longevity records for ringed birds. Bubba was on their records having being reported from Rothera in 2009 and at that time was the oldest brown skua on record. The last sighting in 2015 made Bubba a record breaking (as far as BBL records are concerned) 34 years and two months old. Bubba's presence is greatly missed but those of us that remember will never forget this special bird.

– Ali Massey

SCAR Reaches 60th Anniversary

Since its first meeting in The Hague in February 1958, SCAR has grown an international network of thousands of scientists who share a common ambition to carry out Antarctic science for the benefit of society. With a membership of 43 countries, SCAR is instrumental in initiating, developing and coordinating high-quality international scientific research in the Antarctic and the Southern Ocean. For more information see www.scar.org.

– Linda Capper



KEP Football Glory Continues



▲ KEP and Bremen FCs

On 27th December German squad FC Bremen challenged KEP FC to a game of football on Grytviken's boggy, gravel and burnet-covered pitch. Little did they know that the home side had anticipated such a test and had been training year-round for such a day. With the stakes high and the team fully psyched, the tense atmosphere was broken by the whistle. Immediately KEP piled on the pressure and took control. With the crowd going wild in support of their players, KEP racked up the goals to make it 6-1.

With five minutes to go and the game in the balance a young Welshman broke through the German defence, sensing the opportunity to add his name to the history books. Flicking the ball over his head with a scorpion kick, he smashed the ball into the top of the net (photos unavailable) as the final whistle blew.

After a lap of fan acknowledgement, both sides came together for congratulations and a group photo. KEP FC didn't bask in victory long as sights were set on HMS Clyde FC. On 17th Jan, the marines took a hammering, losing 4-0 to the imperious KEP side in a game full of hearty tackles and screamed encouragement. KEP remain champions of South Georgia, though *Pharos* FC fancy their chances so the training will continue.
– Kieran Love

New Satellite Provider For BAS



▲ Halley VI at OmniAccess HQ

Our new satellite provider is a company called OmniAccess based in Palma, Majorca. To show what it means to them to have BAS as a customer they have this picture on the wall of their operations centre (see photo above). It's a constant reminder that they are delivering connectivity to the ends of the world, and shows the satellite we currently use, and others that are potentially in sight. The project to change providers has been going now for almost a year, and has been managed exceptionally well by

Karen Fowler, with very little disruption to users.

The new hardware means we can provide improvements in how we supply and manage our limited bandwidth to ships and stations. The biggest change is the ability to share unused bandwidth to other locations, e.g. with Halley shut, other sites can take benefit of the bandwidth they had.

The next stage of the project is hardware upgrades at Bird Island and Signy, as well as installation on RRS *Sir David Attenborough*. We have also had discussions with OmniAccess about future technology and other ways of managing bandwidth.

– Paul Beard



MAGIC Image Of The Month

MAGIC Image #75

MAGIC, in collaboration with the Ecosystems Science Programme, have completed the data collection phase of a new WWF-funded project to estimate emperor penguin population trends in the Antarctic Peninsula and Weddell Sea.

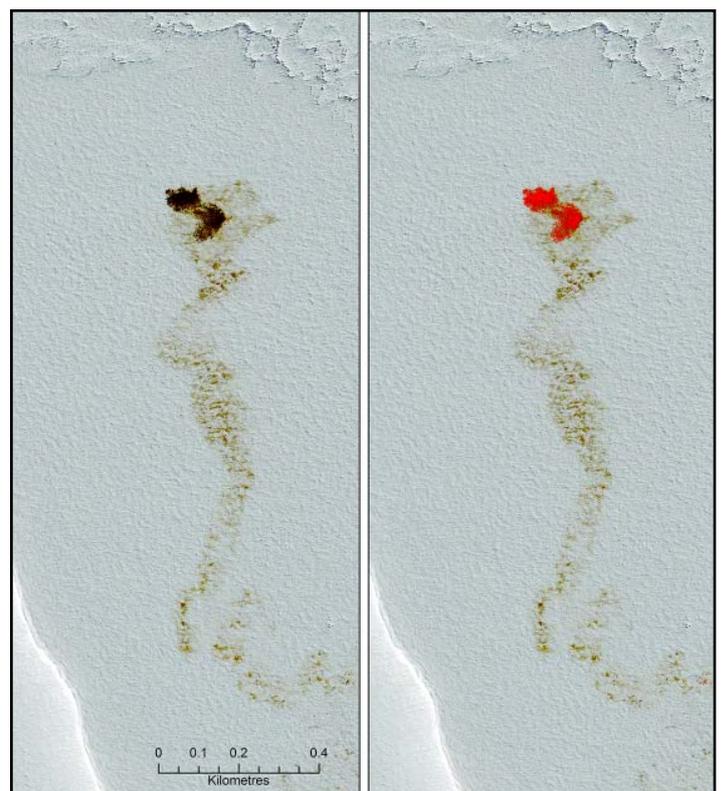
MAGIC postdoc Jennifer Brown was employed for three months to undertake the image processing work. The analysis used very high resolution satellite imagery of 16 emperor colonies in each breeding season over the period between 2009 and 2016, giving us an eight-year time series involving analysis of 114 discrete images. A single image for each colony was analysed using a supervised classification algorithm that calculates the area of penguins. This figure was then converted into a population estimate using field-measured, known huddle densities. The results

from the analysis are just beginning to be assessed and initial findings reveal a number of very interesting patterns that will be published in a future scientific paper. This will be the first population trend data for emperor penguins in the Weddell Sea/ Antarctic Peninsula area, as the only colonies that are monitored at present are in East Antarctica. This dataset therefore gives a unique insight into the population trend of this charismatic bird, and we hope in future to link the data to environmental drivers to better model and understand the future of the species.

The image shown here is WorldView2 data of the Stancomb Wills emperor penguin colony (east of Brunt Ice Shelf and Halley) in September 2011, with the associated classification result of penguins shown in red on the right hand pane.

The number of penguins in this image was calculated as around 6,200 adults, the sinuous pattern beneath the

darker patch of penguins is the guano trail left as the colony has moved during the winter.
– Peter Fretwell



▲ The emperor penguin colony at Stancomb Wills, east of Halley

Fellowship Completed – Farewell! RRS SDA Almost In One Piece

Over the last 18 months I've been a Postdoctoral Fellow in the Ice Dynamics and Palaeoclimate Group. My research focuses on how climate variability changes as the Earth warms (or cools). At BAS I planned to run isotope-enabled climate model simulations, whose output can be compared to paleoclimate records from ice cores. An additional challenge is, however, that the proxies we use for past temperature (water isotopes), and sea

ice (salt), are related to each other.

To better constrain this with a modern dataset, Max Holloway and I went south on the *Shackleton* with a CASS project, and took snow samples on the Ronne and Brunt Ice Shelves, and on the sea ice along the way. I would like to thank everyone who made my stay in Cambridge and on the *Shackleton* such an amazing, successful experience.
– Kira Rehfeld



▲ Collecting sea-ice samples on the Brunt Ice Shelf

Springwatch At BAS Cambridge

For those in the know, this project has taken a long time to come to fruition, but BAS has now got a nest box which can be monitored in real-time. This is another Biodiversity@BAS team initiative, aiming to enhance the biodiversity of the Cambridge site, but could not have been realised without help and support of many people. The Estates Team provided funding, climbed ladders and attached whatever necessary to the outside walls of buildings; the IT Team provided advice and cabling to allow connection of the

nestbox to the Cambridge IT network; the Manager of the Met Workshop allowed use of their 'hole in the wall' and a network port. To watch what is going on inside the nest box, point your web browser at the following url: <http://basweb.nerc-bas.ac.uk/~agw/nestbox>

At this time of year we do not yet know if we will get nesting birds, however the accompanying image shows the first visitor on 21st February 2018. We expected great tits, but the image shows that blue tits are also interested. The box had a nest last year, so fingers crossed for this year.

If you would like to participate in future Biodiversity@BAS activities, join the BAS Biodiversity Office365 Group or take a look at the website: https://ishare.apps.nerc.ac.uk/teams/bas_biodiversity/SitePages/Home.aspx
– Andy Wood



▲ A blue tit caught on camera



▲ Welding around the clock

The building of RRS *Sir David Attenborough* continues apace with welding teams working around the clock to complete the construction of the hull and the primary decks. Once the ship is 'in one piece' it will



▲ The crane control room (top)

enter the water at a special event in May this year before having the superstructure attached and the rest of the fit-out and painting completed in dry dock.
– Shelley Bolderson

Spotlight On Science – Oct 2017

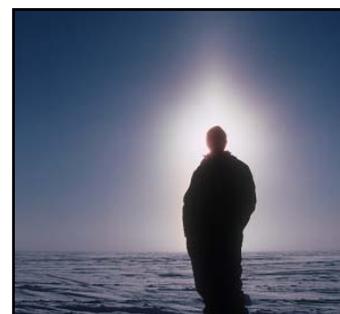
An Assessment of Recent and Future Temperature Change over the Sichuan Basin, China, Using CMIP5 Climate Models

The Sichuan basin is one of the most densely populated regions of China. Along with insufficient arable land and economic underdevelopments, this region is particularly vulnerable to climate-related stresses. Improving the predictability of extreme temperatures over the Sichuan basin is important due to the profound implications of climate change on internal heating and cooling loads in the ever-expanding urban regions.

Using the coupled climate models from the CMIP5 exercise, we find that the Sichuan Basin will warm by 0.72°C per decade and by 2100 the central plains of the Sichuan basin will

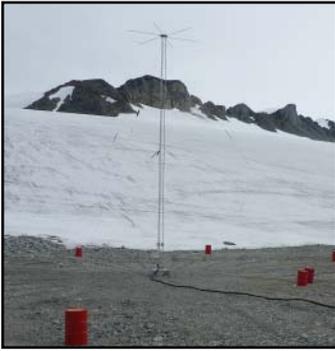
have increased by 4°C. The frequency of extreme months (where mean temperature exceeds 28°C) is shown to increase in the 21st Century at a faster rate compared to the 20th Century. Therefore, the frequency of more extreme heatwaves across the Sichuan basin is projected to increase.

These findings will help provide guidance for future climate projections in further research which focuses on urban planning and design based on thermal comfort conditions in the Sichuan basin.
– Daniel Bannister



▲ Climate projections in Sichuan

Rothera Nav Aids Relocated



▲ The NDB in its new location

The existing navigational aids at Rothera sat in the prime location identified for blasting/quarrying to enable rock fill for the new wharf to support RRS *Sir David Attenborough*. This project therefore focused on relocating and installing new navigational aids ahead of the blasting activity.

The navigational aids comprise of two systems: Distance Measuring Equipment (DME) and Non-Directional Beacon

(NDB). The NDB provides directional information to the aircraft, allowing the aircrew to home into the signal. The DME system provides the aircrew with the distance information from the aircraft to the ground station. Both provide critical safety information. The team at Rothera have successfully installed new NDB and DME systems. The new NDB is behind the hangar and the new DME is on the point next to the Bentham container.

This has been a tremendous team effort from many people. We are now in a very strong position to start blasting/quarrying next season. Well done everyone.

As well the navigational aids relocation, other works have been completed at Rothera to prepare for next season's increased activity. The kitchen

BAS stations

has had a large amount of new equipment installed to give it added capacity, including an additional floor-standing steam oven, new fridges and a prover unit.

Despite the late ship call all this is now in place ready for next season and the tech team are preparing for the installation of the temporary camp when it arrives from Halley at the end of March.
– *Andy Barker & Joe Bolton*



▲ The DME at Rothera Point

2018 – Year Of Engineering



2018 is the Year of Engineering – a year-long, cross-Government initiative which celebrates the world and wonder of engineering to raise the profile of engineering and inspire the next generation of engineers.

Throughout the year BAS will be drawing attention to the exciting innovations in polar engineering that enable us to complete frontier science in Antarctica and the Arctic – not least the launch of the new polar ship RRS *Sir David Attenborough*.

– *Linda Capper*

JCR vs Rothera Football Match

February saw another intense football contest at a BAS Antarctic station, this time a keenly-fought, eleven-a-side game between the crew of RRS *James Clark Ross* (plus three willing volunteers from Rothera) and a highly-competitive Rothera FC XI.

After the final whistle blew, the JCR had their noses in front and celebrated a dramatic 2-1 win (despite both goals being scored by the Rothera players on the team!)... but never mind that, a win's a win!

– *Brian Winton*



▲ Both teams hug it out after

AURORA Innovation Centre

The significant increase in public concern about global stewardship of our environment following Blue Planet II, Sky Ocean Rescue and the Ellen MacArthur Foundation's New Plastics Economy for a Global Plastics Protocol, publicity in recent months has forced this topic rapidly up the political agenda, occasionally trumping Brexit news, and switching Michael Gove from single-use coffee cups to a reusable version!

The Circular Economy (CE) and plastic/fibre resource 'leakage' now features heavily within NERC, GCI SDGs (Horizon 2020 CE budget €941 million) and the BEIS Industrial Strategy 'regenerative circular economy' alongside DEFRA's 25-year environment plan. Through the BAS Plastics Group the interest in our supporting science for Circular Economy/Plastics in the

Oceans events held at BAS this year has seen AURORA attendance records broken again – over 300 external attendees for these events in 2018 so far, with an AURORA 2018 visitor footfall passing 1,000 in mid-March.

On 7th March we held a Plastics in the Oceans event at which CEO of NERC Prof Duncan Wingham was an



▲ Visitor numbers for 2018 have exceeded 1,000 by mid-March

AURORA

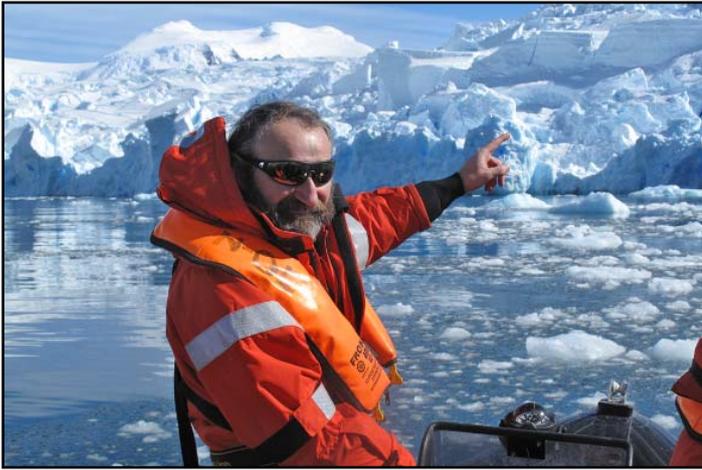
opening speaker for ten others that included British Plastics Federation, WRAP, Sky Ocean Rescue – plus ten exhibitors with the event limit of 150 being oversubscribed.

Many thanks to all involved for your supporting role in making AURORA a growing success and expanding awareness of BAS expertise to new sectors.

– *Matt Polaine*

Financial Times Visit To Rothera A Great Success

BAS media



▲ A boat trip to the Sheldon Glacier to show its recent retreat

Early in January I set off for Rothera with a team from the Financial Times, Environmental Correspondent Pilita Clark and Chief Photographer Charlie Bibby, as part of the annual programme of BAS media visits. The FT will publish magazine, news and online content later this year about Antarctic science, operations

and innovation, explaining to the very influential FT audience why it matters to them.

The visit began in Punta Arenas when Rob Larter took us onboard the *Discovery*, prior to cruise departure a few days later, to demonstrate shipboard science. A

memorable moment was Rob demonstrating ice-shelf dynamics for the FT using packets of mayonnaise, ketchup and mustard over lunch (see *photo below*).

The arrival (by aircraft) at Rothera was staggering for all of us on our first trip there, including Pilita and Charlie. We were made to feel extremely welcome from the start, and little by little we got to grips with the – initially overwhelming – ways of working in Antarctica. Charlie was lucky enough to get on a flight to Fossil Bluff, enabling him to capture stunning imagery of the hut and the landscape nearby, which will certainly feature in the final output. We spent a wonderfully atmospheric day on Lagoon Island with Matt Davey from Cambridge University studying snow algae, and had the most

perfect blue skies for a trip to Sheldon Glacier with Pete Fretwell, showing us the extent to which the ice cliffs have retreated in the past 25 years.

So many other BAS staff, in all sorts of capacities, were very patient and generous with their time, giving us tours and demonstrating or explaining their work. It was hugely appreciated by Pilita and Charlie, who emailed me after our return home to say “nothing feels quite the same now”.

– Sarah Vincent



▲ Talking ice-shelf dynamics

The All Shacks vs KEP Premier XI



▲ The pitch doesn't exactly help with finesse and fancy footwork

RRS *Ernest Shackleton* took a pause after offloading the Bird Island cargo and personnel to let the BI winterers visit their neighbours at KEPA challenge from the unbeaten South Georgia football champions to ‘take them on’ ensued.

On 20th February the two teams arrived at the Grytviken Football Stadium to ‘lock horns’ in an attempt to topple KEP from their undisputed top spot. However, both teams appeared wearing white which made for some confusion amongst the ranks. The *Shackleton* team rectified

the situation by revealing black t-shirts underneath, which given their chosen name ‘The All Shacks’ was quite fitting.

With the presence of MV *Hanseatic* in the harbour and tourists ashore, along with the odd penguin, there was a really good turn out of spectators. After a well-fought contest, KEP Rovers were happy to remain undefeated champions as the result was 5-1 in favour of the home team. Good fun, cuts and bruises were enjoyed by all and we now await the highly-anticipated rematch.
– Steve Stiglic-Buxton

BAS Science Funding Successes

In the autumn, BAS welcomes three new successful Marie Curie Individual Fellows (IFs) joining our PICC and PO teams. This is equivalent to 50% success rate for BAS this year, and the first time BAS will host this many at the same time. The fellows are:

- Lara F Pérez, working with Rob Larter on the three-year project WAMSISE: West Antarctic Margin Signatures of Ice Sheet Evolution
- Irena Vankova, working with Keith Nicholls on project DOVuFRIS: Detecting Ocean Variability under Filchner-Ronne Ice Shelf (two years)
- Louis-Alexandre Couston, working with Adrian Jenkins on two-year project MIMOP: Modelling Ice-shelf Melting and ice-Ocean Processes via the phase-field method and direct numerical simulation

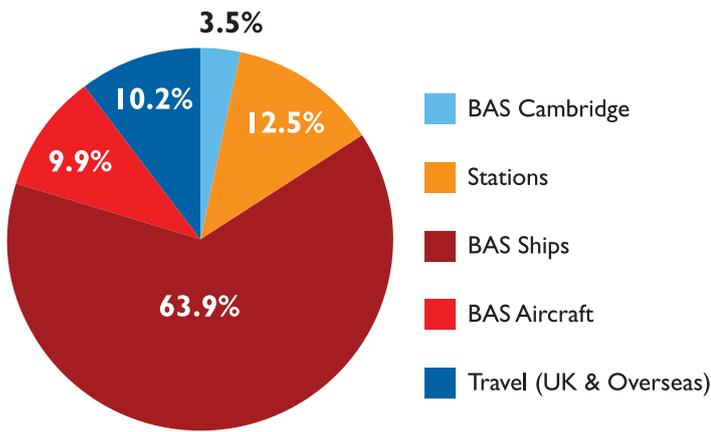
If you are interested in becoming an MSCA Individual Fellow at BAS or would like

more info to help someone join your group, please contact Ana Pereira-O’Callaghan. Potential new fellowship proposals in 2018 need to register their interest with ReDS Pre-Award Team by 15th June 2018.

Additionally, a successful Darwin Plus round six grant, led by Phil Trathan, in collaboration with Vicky Warwick-Evans, will develop the risk assessment framework for the Antarctic krill fishery.

As part of ongoing ESA work, Fausto Ferraccioli has secured funds to expand the 3D Earth project (led by CAU Kiel) using the latest Antarctic-wide compilation of aeromagnetic data (ADMAP 2.0). The two-year ADMAP2.0+ project will carry out an analysis of aeromagnetic and satellite data to investigate the fundamental crustal architecture of the Antarctic continent.
– Ana Pereira-O’Callaghan

BAS Carbon Footprint: Up/Down?



▲ BAS carbon data 2016/17

Is the annual carbon footprint of BAS rising or falling? On one hand, total energy consumption at BAS Cambridge fell by almost 32% between 2010 and 2017. This was a result of several completed energy-upgrade projects including insulation improvements, boiler replacement, cold room refurbishment and LED lights.

On the other hand, as we grow, demand for energy increases. For example, completion of the AURORA Innovation Centre results in increased energy demands in electricity and heating; as we carry out more science and logistics work, we rely on additional ship and aircraft journeys, burning more fuel. Our challenge as we grow is to

BAS energy

develop smarter and cleaner ways of working. In fact, in the last financial year, BAS's carbon footprint was 30,500 tonnes of CO₂ equivalent, a figure that is rising every year.

One of our stated ambitions as part of NERC is to improve our environmental performance, and the Estates Energy team will provide regular updates on our progress. Please look on the Intranet under: *People & Teams/Environment Office/Environmental Management* in Cambridge to see latest energy consumption figures.

As part of the British Antarctic Survey, we can all assist in improving BAS environmental performance and make a difference whether we are in our office, laboratory, meeting rooms, stores or garage!
– Nopi Exizidou

Laws Prize 2018 Nominations

The Laws Prize Committee invites nominations for the 2018 award. The Prize is awarded annually to an outstanding BAS early-career researcher who has proven aptitude for research and is likely to make a significant contribution in the future. Candidates should be nominated through the Science Leaders (for Science Teams) or Tim Stockings (for Operations and Engineering) and sent to Ali Teague.

Please address any queries in confidence to Professor David Walton – dwhw@bas.ac.uk – Secretary, Laws Prize Committee at BAS Cambridge. Please note that the closing date for submission of nominations for this year's award is 26th April 2018.
– Ali Teague

Almirante Irizar – Argentine Visitors At Rothera



▲ Despite the weather, the visit was hugely enjoyable for everyone

The *Irizar* is the hugely impressive Argentine naval icebreaker newly refurbished following a fire onboard in 2007. At 121m long, 25m across the beam and drawing 10m she is capable of crunching through 6m of sea ice and carries over 300 personnel.

On 2nd March we learned she would be in the vicinity of Rothera to re-supply San Martin just 40 miles away. They made contact via VHF

and an agreement was made that they should visit the station on 5th March. Not the prettiest weather day with snow flurries providing a suitably atmospheric feel, we watched as she hove into view from the midst of the low cloud. Her draught meant she was unable to tie up at the wharf so instead she stayed off a little way and in no time we saw a heavily laden zodiac approaching. Onboard were 11 members of the crew consisting of high ranking crew

members and people from the Instituto Antartico Argentino.

With big smiles they climbed the rope ladder to gain access to the station and we sent 11 of our staff down to join the zodiac to be taken back to the *Irizar* for a tour of the ship. Over the next two hours we gave them a detailed tour of the Bonner Lab, including information on the current science projects and also the hangar, which at that time was housing the Dash 7 and one Twin Otter. Then to NBH for

tea, scones and Bakewell tart (obviously) followed by an exchange of gifts.

It was an incredibly positive visit with lots of laughter and friendships made. We returned to the wharf to find our staff back from the *Irizar* in what can only be described as 'a heightened state of morale' having been treated to fine cuisine and significant amounts of merriment. A terrific visit from both sides, long may the partnership continue.
– Paul Samways



▲ Eleven BAS staff were treated to a tour of the *Irizar*

BAS stations

Fossil Bluff Renovation Complete



▲ Looking shiny and new

Over the last two seasons, Rothera Estates Team has been working with Archives and the Environment Office to deliver conservation works to Fossil Bluff. The aim of the project was to renovate tired areas of the main building (Bluebell Cottage) in the most sympathetic way possible, to help improve staff welfare and maintain its original charm.

The hut isn't an Antarctic heritage site, but it does have historical value. It was built in 1961. Except for efforts to up-keep the painted exterior, little

work has been done to the hut in recent years. Consequently, the roofs had holes, looked tired, and were in desperate need of restoration. Inside, the paint was flaking and the vinyl floor was worn.

This season the interior received a full overhaul with new ceiling, paint job and flooring. The exterior was over-clad in flat tin sheet to protect the facade and prevent flaking paint blowing into the Silent Sound. Last season the main roof was recoated with bitumen and the north and south annex were fully refurbished. These works should keep the Bluff in good stead for several years to come, and will once again make this delightful and charming hut a desirable place to work and live. Many thanks to everyone involved.

– Tim Jackson

Cambridge Science Festival 2018

BAS is participating in several public events at this year's Cambridge Science Festival to raise awareness of our science and operations. The extremely well-established festival comprises many hundreds of events takes place in and around the city from 12th to 25th March. We are involved in five different events, from talks to drop-ins, which are all detailed on the BAS website: www.bas.ac.uk/our-events.

We are opening the doors to the AURORA Innovation Centre on Saturday 24th



▲ AURORA from the air

March for 'Antarctica Uncovered' as part of the West Cambridge Site events. We'll host a drop-in event from 11.00-15:00 where visitors can enjoy a rare glimpse into our world to learn more about our ships, stations, science kit and science capability. There will be a series of 'engagement stations' and films in the AURORA space. From 10.00-11.00, we'll be offering exclusive access to BAS staff and their friends and family, so please note this in your diaries. There may be cake for our younger visitors and an exciting trail too! More info here: www.bas.ac.uk/event/cambridge-science-festival-antarctica-uncovered.

Thanks to all who have already offered to help on the day. I am seeking additional volunteers, so if you'd like to get involved then please drop me a line. – Athena Dinar

BAS EMS Is Changing!

BAS has been certified to the International Standard for Environmental Management ISO 14001 since 2007. Up until now, the scope of the BAS Environmental Management System (EMS) has only included the Cambridge site, RRS *James Clark Ross* and RRS *Ernest Shackleton*. However, the standard has been updated and our new scope now includes all of our science and operations at BAS research stations in Antarctica and South Georgia. The scope will also include RRS *Sir David Attenborough* once it is in final acceptance in late 2019.

We already practice good environmental management on the stations, which meets and often exceeds the requirements of the Environmental Protocol and the BAS Environmental Strategy. With the expansion

in scope, we will need to provide additional evidence of our processes by conducting annual environmental audits. Audits are a way to identify if things are working according to plan and what, if anything, needs to be done to improve a management process. The audits will focus on areas such as waste management, biosecurity, oil and fuel storage and spill response.

The overall goal of the EMS is to continually improve the environmental performance of all BAS activities. We can achieve this by working together to determine what is working well, in terms of environmental management, and what we could be doing better. If you have any suggestions, feedback or questions about the new EMS scope email katmor@bas.ac.uk. – Kate Morley

Spotlight On Science – Nov 2017

More losers than winners in a century of future Southern Ocean seafloor warming

A recent study of the marine invertebrates living in the seas around Antarctica reveals that there will be more 'losers' than 'winners' over the next century as the Antarctic seafloor warms. A BAS team examined the potential distribution of over 900 species of shelf-dwelling marine invertebrates under a warming scenario produced by computer models. We concluded that, whilst some species will benefit, 79% of the species native to the region will lose out. This has important implications for future resource management in the region.

An average warming of 0.4°C is predicted by 2099, and whilst this warming will not be enough to allow any species

from other neighbouring continents to subsequently invade or colonise Antarctica, it will cause the unique local species to change their distribution. More animals will lose suitable habitat than will gain it, with those animals especially adapted to the coldest water on Earth (for example in the Weddell and Ross Sea) losing out the most. Areas of the West Antarctic Peninsula may become too warm for many native species.

The seafloor animals of the Southern Ocean shelf have long been isolated by the deep ocean surrounding Antarctica and the Antarctic Circumpolar Current, with little scope for southward migration.

– Huw Griffiths



Halley's Medical Top Brass

The names of the last 60 years of Halley Medical Officers has been remembered on a new board in the Medical Room in C module at Halley 6A. The board was created by Dr Neil Spencer (2016/17) with help from the station carpentry team. It is made of laminated oakwood and is a lovely reminder for all new Halley Doctors joining the small group of medical practitioners that have had the honour to practice on the Brunt Ice Shelf. – *André Dubois*



▲ The board at Halley

Place-Name Of The Month – #41

In a departure from tradition, this edition's place-name article highlights places that no longer exist; these are marked with an asterisk in the APC gazetteer and on the web-map. Due to the changing nature of the Antarctic landscape there are a number of features which have been renamed or flagged by the Antarctic Place-names Committee. This is partly in response to

the changing face of the ice shelves, allied with increased remote sensing capabilities.

Given the recent exploration of Prince Gustav Channel by RRS *James Clark Ross*, it is fitting to start with what was there before: The Prince Gustav Ice Shelf, which extended into Röhss Bay, James Ross Island. This ice shelf started retreating in 1945 and



▲ The area formerly known as the Wordie Ice Shelf

Antarctica

continued until its final break-up in February 2002.

Similarly, the Wordie Ice Shelf formerly extended into Marguerite Bay, but gradually retreated and broke apart up until 2004, when it finally disappeared entirely. The newly-formed area has since been named Wordie Bay (69°06'S, 67°45'W).

The ice-shelf retreat also revealed islands which were previously hidden: Buffer Island and Napier Island were revealed in 1989, having previously been considered ice rises in the shelf.

If you would like to know more about the Committee or submit a place-name for consideration in the next meeting (May 2018), please see www.apc.antarctica.ac.uk.

– *Elena Field*

Keeping Up Traditions

After a successful trip to the Ronnie Ice Shelf and a second busy call at Halley Creek 8, the RRS *Ernest Shackleton* crew and Halley wintering team celebrated with a meal on the ship. Despite news that the station would not be wintering, the crew and station team sat down for an evening meal, a custom often observed when possible between the stations and the ship during last call.

After dinner the crew and station team went searching

for a possible relief site for the season's planned third call at Halley. Whilst searching, they were lucky enough to see a large pod of 15 orca whales that had decided, like them, that it was a nice evening to check out the creeks of the Brunt Ice Shelf.

Many thanks to the crew and especially the galley team onboard the *Shackleton* for such a wonderful evening and being such good hosts.

– *André Dubois*



▲ Checking out the creeks near Halley on the Brunt Ice Shelf

Updates To The BAS Travel Plan

As set out in the BAS Environmental Strategy 2015-2020, BAS is committed to promoting more sustainable travel. The BAS Travel Plan provides information on the sustainable travel options available to BAS staff in Cambridge for commuting and business travel, and details the support, facilities and technology available.

Travelling more sustainably can have a number of economic, environmental and social benefits some of which include:

- Reduced emissions
- Cost savings (time/money)
- Improved health/wellbeing
- Less road congestion

The Travel Plan has recently been updated and is now available on the Environment Office Intranet pages. Some of the highlights are as follows:

- A 10% discount voucher for Halfords through Travel for Cambridgeshire. The

voucher expires on 31st October 2018!

- Updates on data, bus services and prices
- Four new electric car-charging points at Madingley Road Park & Ride
- New bike repair stations at the West Cambridge site
- Information on OFO bikes (the yellow bikes around Cambridge) and how they work
- Updates on changes since the Innovation Centre has been built, including car/cycling parking facilities and additional meeting rooms for tele/video conferencing
- Changes to the Universal bus service and additional cycling routes with the development of Eddington

If you have any questions on the Travel Plan, pop into the Environment Office (room 331) or email Kate Morley at katmor@bas.ac.uk.

– *Kate Morley*

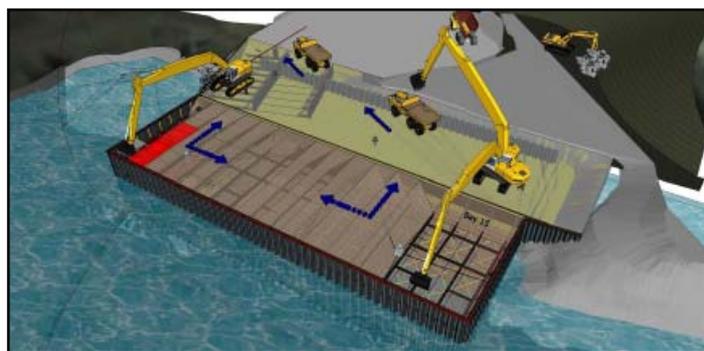
New AURORA Administrator

BAS welcomes Pilvi Muschitiello from Finland as our new AURORA Events Administrator now that Sonia Sargent has left us. Pilvi comes with a great event customer-service track record, is widely travelled and multilingual. For those top runners in BAS, Pilvi represents some significant competition (see BASSC on Strava)! She will provide her proper introduction and initial impression of BAS in the next ICESHEET. Welcome to BAS!
– Matt Polaine



▲ Pilvi Muschitiello

AIM Update: Rothera Masterplan



▲ Construction of the new Rothera wharf begins in November 2018

The Rothera Masterplan, which sets out a vision and high-level plan of what we aim to achieve through the modernisation of Rothera, has been signed off by the Rothera and Islands Board. Final go-ahead has been given to sign the contract for construction of the new wharf – a hugely complex piece of engineering – which will begin in November 2018. The Masterplan was shared with BAS staff during engagement events in February.

Our partners Ramboll and BAM will now embark on the feasibility stage, which will run until June 2018 and provide different options for how to achieve our aims. Further opportunities for staff to hear about plans and contribute ideas will take place during the spring.

The modernised Rothera will continue to support the UK's ambition to be recognised internationally for scientific

BAS stations

and operational excellence. It will be flexible in its design so that new and emerging technologies can be easily integrated. The quality of living and working spaces will be improved; key goals include the reduction in longer-term resource costs and in our carbon footprint.

Meanwhile, work is underway to ensure that all the heavy construction kit needed for the new wharf – including two 300 tonne cranes – will arrive at Rothera ready to begin work in the 2018/19 season. The first task will be to dismantle the existing wharf and move all Rothera small boating facilities to an alternative location on the Point, as it will not be possible to use the main wharf until 18 months later when the new one is complete.

– David Seaton

Pictures From The BAS Archives

BAS collections include a number of artworks by David Smith (1920-1999) who was invited aboard the *Bransfield* during the 1975-76 relief by then Director, Dick Laws. Smith later returned to the Antarctic with BAS for a longer seven-month voyage in 1979-80. In his diary he wrote

of the challenges of painting in freezing conditions – Halley relief was painted on the spot.

Smith is best-known for large-scale, abstract impressions of wind-carved ice features and tabular icebergs. He was fascinated by ship life and on a daily basis produced numerous

watercolours, drawings of ship activities and BAS personnel. He found familiarity in the open seas and big skies around him, which he likened to the landscape painting of his native East Anglia. A small exhibit of his works is planned for the corridor by Archives.

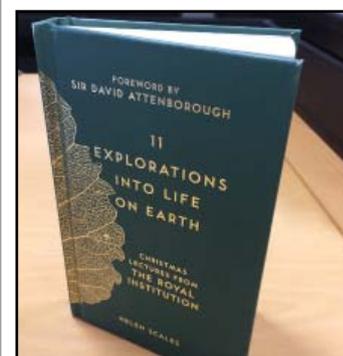
– Bev Ager



▲ RRS Bransfield during the relief of Halley Station, 1979, by David Smith (Archives ref:WA/1P5)

Archive Image #68

And Finally...



▲ The book is in the BAS library

BAS Science Leader Lloyd Peck is a contributing author for the Royal Institution's latest book, *11 explorations into life on Earth*. The book examines our planet and all that inhabits it via 11 of the most exciting and revealing Christmas lectures given at the RI. Lloyd delivered the 2004 Christmas lectures about Antarctica. More info at www.rigb.org/christmas-lectures/books.
– Jamie Oliver

ICESHEET contact details:
Jamie Oliver (jaol@bas.ac.uk)