



2019 – Let's Make It A Greener Year

Director's Office

We are all aware that the world needs to do more to become greener and be more energy efficient, especially if we are going to meet the 1.5°C challenge in the latest IPCC report. During our work in the Polar Regions we can see the impact of global warming first hand, which is a real motivator to become greener and more efficient.

will make a huge difference to our footprint there, with more energy-efficient systems and buildings. Here in Cambridge we are also looking at improvements. We are about to build our new car park covered with solar panels and with charge points for electric cars, and we have had energetic discussions with great suggestions about greening our activities in the recent Ideas Day (see page 3).

energy use is high, compared to the ~20% increase during the working day. The challenge is now to decrease that baseline mode, which is mostly due to cooling/refrigeration units and IT/server equipment. The replacement of old and inefficient systems with more modern versions could cut our energy use drastically, and reduce our environmental impact.

rising we need to be careful. Our Cambridge Carbon Management Plan, led by the Estates Team, will help us deliver a significant reduction in energy consumption in order to achieve the 45% carbon reduction target by the year 2022.

Looking forward, a further increase in renewables in our energy mix, together with energy storage systems, will deliver additional savings. So in 2019 be safe, avoid plastic and go green!

Professor Dame Jane Francis



The modernisation project at Rothera

A monitor in the BAS Cambridge reception area shows that our baseline

Total energy consumption in our Cambridge buildings has actually decreased over the years, but with fuel costs

MOD Support Success For Science Programmes

BAS logistics

The first week of January has seen the successful completion of the Thwaites Glacier Project offload at the Stange Ice Shelf by RRS *Ernest Shackleton* and HMS *Protector* – an excellent example of collaboration with the Royal Navy, delivering 600 tonnes of fuel and equipment for this multi-year joint US/UK project in West Antarctica. The fuel and equipment will be moved to Thwaites by BAS

tractor traverse over the next two seasons, a distance of over 1,000km. This is first time we have used this off-load site and is big step forwards as it gives us another logistics route onto the continent and is very well placed to resupply Sky-Blu.

An RAF Hercules aircraft also carried out eight successful fuel airdrops to an inland site to help facilitate the Thwaites



▲ The RAF Hercules aircraft flying over Rothera, on its way north



▲ An RAF Hercules carried out eight successful supply drops

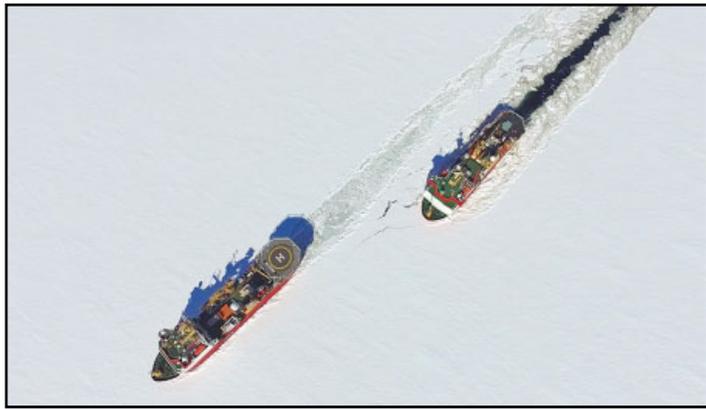
project. Our colleagues at NSF (US Antarctic Programme) have flown 36 Hercules missions to WAIS Divide and mounted their own tractor traverse to help support the project.

One theme that already clearly emerges from this season is how much can be achieved with collaboration and integrated land, sea and air operations.

– Simon Garrod



Ships Use Live AUV Ice Footage



▲ RRS Ernest Shackleton (left) and HMS Protector in the fast ice

Early in the new year RRS Ernest Shackleton reached Case Corner on the English Coast, where it successfully offloaded a mammoth load of equipment and fuel destined for Thwaites Glacier. After escorting the cargo ship DS Wisconsin into Rothera, it was a relatively easy journey south until a painfully slow crawl through the final five nautical miles of fast ice.

Polar View satellite imagery and drone footage identified some weaker ice and the ship



▲ The Shackleton battled through five miles of ice to reach its goal

BAS ships

eventually broke into a polynya along the ice shelf. HMS Protector followed afterwards and cargo work from both ships started quickly.

For the first time the drone footage was delivered live to the ship's bridge, allowing Captain Harper to direct a detailed reconnaissance of the fast ice and shelf edge. The MAGIC Image of the Month (see page 5) also shows the two ships in the ice, but from a bit further away – the Sentinel 1 satellite!

– Andrew Fleming

BAS Cambridge Midwinter 10K

On Thursday 20th December, eight hardy runners took part in the traditional BAS Cambridge Midwinter 10km handicap race. Staggered start times based on the runners' own estimates meant all aimed to finish at the same time.

All survived the harsh winter conditions of 8°C, sunshine and a light breeze with Ella Gilbert crossing the line first in 50:04, over two minutes ahead of her predicted time. Everyone else finished within three minutes of Ella and all received festive bags of chocolate coins. Roll on Midsummer!

– Alex Tate



▲ Runners braved the cold

BAS Publication Success

Congratulations to BAS's Dr Sarah Glauert, whose recent paper 'A 30-year simulation of the outer electron radiation belt' was selected last month as an Editors' Highlight on Eos.org, the weekly electronic science magazine published for the American Geophysical Union (AGU).

Editors' Highlights promote some of the most interesting and impactful research published in AGU journals widely on social media and scientific websites. More at: <https://eos.org/editor-highlights/first-multi-decade-simulation-of-the-earths-radiation-belt>
– Linda Capper



▲ Space science in action

Tracking Grey-Headed Albatrosses



▲ Albatrosses on Bird Island

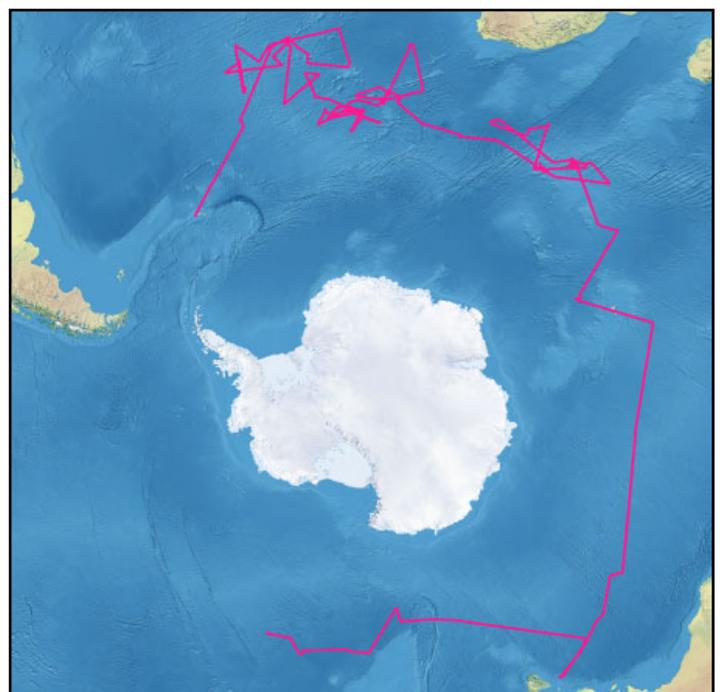
In May 2018, 16 satellite tags were attached to grey-headed albatross chicks prior to their departure from Bird Island. The science questions driving the work are (a) to map the movements and foraging areas of juveniles in order to determine the overlap with fisheries, and (b) to assess the survival rate of juveniles in the initial weeks and months after they fledge.

By December, transmissions had ceased from most devices (probably tape attachment degradation or feathers moulted). Just one bird is left being tracked in near real-time

using the Argos system, but what an amazing route is being revealed. In eight months it has travelled more than 50,000km (tags are active for 8hrs every two days), and is on the way to circumnavigating Antarctica.

BAS science

You can follow its progress on the BAS website here: www.bas.ac.uk/project/grey-headed-albatross-juvenile-tracking. The project will repeat in 2019 with 16 more albatross chicks.
– Andy Wood



▲ The track of the last 2018 grey-headed albatross chick

RS Parliamentary Pairing Scheme



▲ Huw (r) and Daniel Zeichner

At what could be described as an 'interesting' time for British politics, I was lucky enough to spend a week at the end of November in Westminster as part of the Royal Society Parliamentary Pairing Scheme. This scheme gives policy makers and researchers an opportunity to experience each other's worlds. As part of the scheme I was selected to shadow the Cambridge MP, Daniel Zeichner, getting to see what an MP does, including meetings about cycling

networks, transport and the inevitable Brexit. He will be paying a return visit to BAS in 2019.

It was also a great opportunity for us to meet members of the Science and Technology Select Committee, quiz the Government Chief Scientist and talk strategy with people from the Department for Business, Energy & Industrial Strategy. We also got to see behind the scenes in Parliament and watch Prime Minister's Questions with a view of the top of Theresa May's head.

I also learned, first hand, exactly how little time policy-makers have to read and absorb information from experts, highlighting how sometimes 'less is more' in the world of politics.
– Huw Griffiths

Andy Clarke Book Award

A new textbook, 'Principles of thermal ecology: temperature, energy and life', written by BAS E-Fellow Andrew Clarke and published by OUP in 2017 has been awarded the 'Ecology book of the year' prize for 2018. This award acknowledges the important role that books have on ecology and its development, and is awarded to the book published in the last two years that is deemed to have had the greatest influence on ecology or its application. It is open to books published anywhere in the world, and is funded by the Marsh Christian Trust. Congratulations Andy!
– Jamie Oliver



▲ Andy (centre) at the event

Diving Underneath The JCR

Divers at Rothera Research Station completed a fantastic dive on RRS *James Clark Ross* during the recent station relief. Saz Reed was supervising the dive, with Andy Lines (Rothera's new Boating Officer) and Calum Stronach (Rothera's new Dive Officer)

tending the new hard-wired comms system whilst Aurelia Reichardt and Kate Stanton (Marine Biologist and Dive Officer) completed a hull inspection survey from bow to stern of the JCR to look for invasive species as part of Arlie McCarthy's PhD.



▲ Rothera divers checked the hull of the JCR from bow to stern

'Sounds Of Space' Show At BAS

On Friday 16th November, BAS staff and members of the public were treated to a 'sounds of space' performance at the AURORA Innovation Centre. Nigel Meredith gave a scientific presentation introducing the 'sounds', which were subsequently used in the performance.

The show included animations and soundscapes put together by artist-engineer Diana

Scarborough, live music by leading Australian composer Kim Cunio and his son, Samarai, and contemporary dance by Becky Byers.

The show, which was produced by BAS Creative Services Manager Pete Bucktrout, was live-streamed and can now be viewed here: <https://www.youtube.com/watch?v=F35SLqBEFw8>.
– Nigel Meredith



▲ The conference theatre was full for the visceral performance

BAS ships



▲ In the dive boat beforehand

The underwater inspection of the ship went very well and we'd like to say many thanks to the Bonner Lab team, Rothera Operations and to the *James Clark Ross* for their cooperation and overall support during a very safe and fantastic dive.

It will be interesting to analyse the results of the dive as we found lots of seaweed and barnacles!
– Saz Reed

Meeting My BAS Inspiration



▲ (L-r) Pete Bradley, Rob Weight, Sammy the Seal and Percy Penguin

It's 1995, and Rob Weight has just returned to the UK from his last trip south. Having worked on RRS *Bransfield*, and at Halley IV and V, he now finds himself working for a year as an instructor at an adventure centre. Situated on a small island off the West Coast of Scotland, it's here he meets ten-year-old Pete Bradley and amazes him with his adventures of working in Antarctica. Rob also introduces his companions, Percy Penguin and Sammy

the Seal (rescued from the Halley IV buried 'Seal Club Bar') which have continued to accompany him on his travels around the world.

Fast forward 23 years to December 2017. After getting one of the BASMU Doctor positions, I felt compelled to track Rob down and let him know that I had never forgotten his stories and photos from working for the British Antarctic Survey. Ever since, it had been an ambition

BAS staff

of mine to visit the Antarctic and I wanted to thank him for the inspiration.

After sending him a Facebook message, Rob replied... "Peter, I can't thank you enough for making the effort to contact me, it has really made my day. It's my Mum's 80th birthday today and when I told her about your message she said "what a lovely story!"

Since making contact we were able to meet up in person and recreate the scene from our first encounter (see pictures), with mascots Sammy and Percy included! It's rare you get to say thank you to those special people who inspired you in life – if you get the chance, take it. One day you may find you changed the lives of those who are yet to hear of the great work BAS does. – Pete Bradley

MEP Visit To BAS Cambridge

We were pleased to share the importance of polar science with MEP for East of England, Alex Meyer, when she visited BAS in November. She had requested a visit to learn about policy governing Antarctica; in particular CCAMLR, recent discussions around new Marine Protected Areas and the Antarctic Treaty. The photo shows her trying on some polar clothing to get a taste of what it is like working in Antarctica.

– Sarah Vincent



▲ MEP Alex Meyer at BAS

All Systems Go For Rothera Wharf Construction



▲ Rothera is a busy place this season as construction begins

The wharf re-construction project is now fully underway at Rothera. After an intense period of cargo management and biosecurity checks at Teesport, followed by explosives loading at Sheerness, the DS *Wisconsin* had a good passage from the UK to Antarctica, finally arriving at Rothera on 28th December, two weeks later than scheduled. For the last few hours of the voyage it was escorted through the sea ice by RRS *Ernest Shackleton*.

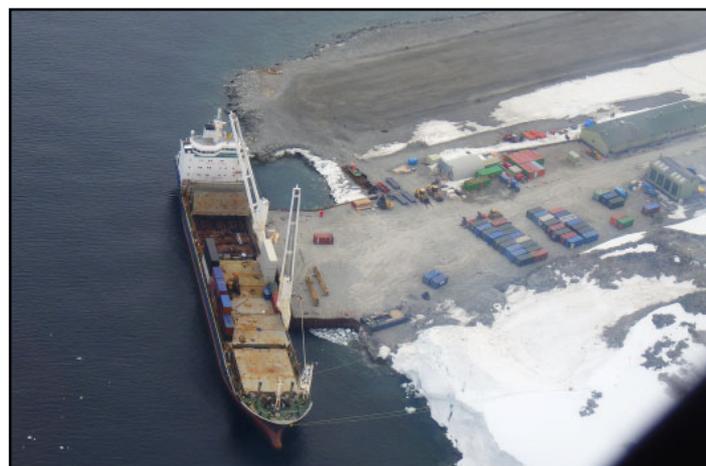
BAM has been working shifts around the clock to unload the cargo, expected

to be completed around 10th January. The BAS team has provided tremendous support to reach this significant milestone. There have been a large number of flight and ship schedule changes impacting on science, support and construction resources, which have been managed very efficiently. The Rothera station team have done an excellent job in completing the project enabling works, which include fitting out Old Bransfield House and the new Vikings accommodation block, and converting the Boat Shed into a mess hut for the construction team. There have

also been upgrades to the facilities in New Bransfield House and in power and water generation. Not forgetting managing the huge quantities of additional food required this season!

The BAM team on site now number 49. Prior to the ship arriving they went through full station induction and established the construction site. There has been lots of

joint working between BAM and BAS. The BAM team has been making a good contribution to gash duties and helping with other station activities, such as clearing out the Miracle Span. There has been very good feedback on the atmosphere on station so it appears that all the efforts driven by Dave Wattam and his team on station integration planning are paying off. – David Seaton



▲ The DS Wisconsin at the current Rothera wharf for unloading

BAS stations

Penguin Surveys Begin At Signy



▲ Adélie penguin family photo

As ever, the wildlife arrived at Signy earlier than us; the Adélie penguins, having already laid their eggs, were actively incubating them from the elements. This meant we were playing catch-up with the year's monitoring work and we quickly got out into the field to count the colonies.

Once the initial surveys were conducted, and a regular study site established, it became a

waiting game for the chicks to start hatching. It didn't take long, on 28th November we had the first chick pipping out of an egg. Once one chick hatches the others are close behind and within just a couple of weeks the colonies were full of chicks. The first sign of their presence is their high-pitched squeaks sounding out from under the brooding adults, but as they get older and bigger it becomes easier to see them, especially when begging for food.

The next stage is the crèche period when the chicks gather together for safety and warmth whilst both the parent birds are feeding at sea. This will start to happen very early in the New Year and our monitoring will continue to ascertain the season's success, let's hope it is a good one!

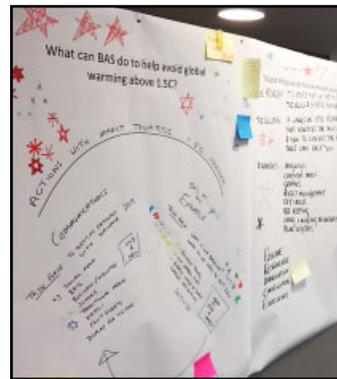
– Tim Morley

BAS Ideas Day 2018

On 17th December we ran the first ever BAS Ideas Day – an opportunity for everyone to contribute to finding solutions to BAS-wide challenges.

Four teams from across BAS worked on topics chosen from a great range of valuable submissions to the online BAS Idea Management Tool:

- What can BAS do to help avoid global warming above 1.5°C?



▲ Lots of new ideas!

- Sustainable transport to work
- 'Stupid things we do that we shouldn't be doing'
- How can we improve internal awareness and communication?

The outcomes were presented in the AURORA Conference Theatre to BAS staff and BET before the Christmas lunch, and BET will now prioritise how they are taken forward. Thank you to everyone who contributed their time and creativity to help shape our future at BAS.

We aim to run such Ideas Days at least once a year, and the online Idea Management Tool remains open – keep submitting your ideas as they will be looked at, discussed and if possible taken forward also in between Ideas Days!

– Beatrix Schlarb-Ridley

Prof Lloyd Peck – Old School



▲ Lloyd presenting an award

Prof Lloyd Peck was asked to present the prizes at his old school Speech Day at the end of October. The school was founded in 1554 and is a fixture in the UK top 500 schools academically (top 200 state schools). It was outstanding at cricket this year, making the UK schools top 100, and runs a thriving cadet force. An unusual accolade is that one of the pupils designed the new 12-sided one pound coin! Amazingly, Lloyd still holds five school middle-distance running records including the Under 15 1,500m record at 4min 10.2sec!

– Jamie Oliver

MAGIC Image Of The Month

MAGIC Image #80

These images show RRS *Ernest Shackleton* and HMS *Protector* in their work supporting the Thwaites Glacier project.

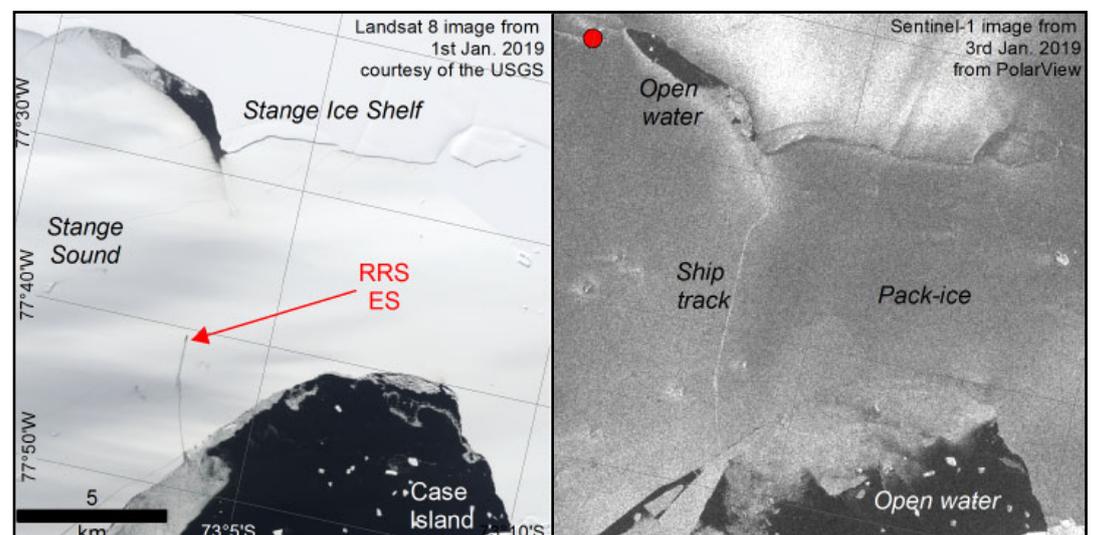
In the first Landsat-8 optical image from 1st January, the ES is visible cutting through pack-ice in Stange Sound, between Smyley and Case islands. The second image is a Sentinel-1 radar image obtained from

Polar View (www.polarview.aq). It was taken on 3rd January and shows the track of the ship leading to open water at the edge of the Stange Ice Shelf, where the ships were dropping off supplies.

The exact location of the ships in this image was slightly more unclear, but is shown by the red dot and was identified

from OpsGIS (<https://opsgis.web.bas.ac.uk/opsgis>) where you can track the location of our ships and planes after logging in with your LDAP/ South password. If you have any questions about satellite images or anything else 'geo', please contact basmagic@bas.ac.uk or use our helpdesk to make requests.

– Laura Gerrish



▲ RRS *Ernest Shackleton* and HMS *Protector* can be tracked via satellite during their recent trip south

Welcome To Our New AURORA Members

AURORA Cambridge



▲ The Polysolar team develop transparent photovoltaic technologies

From January 2019 onwards, two new companies are joining our current AURORA Members – Scale Partnership, CamRosh and IAATO – in the Collaboration Space: Polysolar and Entomics.

Polysolar is a leading BIPV (Building Integrated Photovoltaic) company, developing and manufacturing

transparent solar PV glass that turns building windows into power stations. Polysolar plans to continue to innovate and develop next generation photovoltaic technologies at BAS, to facilitate the transition to a low carbon economy without negative impact on the functionality, architectural aesthetics or cost of construction.

Entomics is a startup founded by a group of graduates from the University of Cambridge to address the problem of food wastage through insect bioconversion: using insect larvae to turn food waste into insect biomass, rich in protein and fat. These can in turn be processed into sustainable sources of animal nutrition.

Over the past three years Entomics have developed a range of technologies for this growing sector, and have built

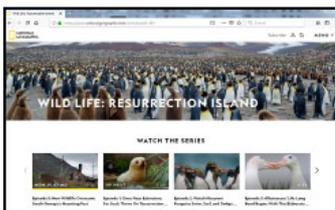
up strong R&D ties across the UK and Europe. Their R&D laboratory is based in the Department of Veterinary Medicine at the West Cambridge site, conveniently close to AURORA.

They will introduce themselves and their work in quickfire talks open to all at BAS in due course – in the meantime feel free to drop into the Collaboration Space and introduce yourself to them!
– Beatrix Schlarb-Ridley



▲ Entomics is a startup founded by a group of Cambridge graduates

Nat Geo Films Talk At BAS



▲ The films are available online

National Geographic wildlife filmmaker Bertie Gregory gave a talk to BAS staff on 26th November in the AURORA Conference Theatre about his trip to Bird Island last season for a series called 'Resurrection Island'. Bertie talked about the film shoots, what it was like filming around South Georgia and working at Bird Island. The talk was followed by a Q&A session and was enjoyed by all. You can watch the stunning series of short films here: <https://www.nationalgeographic.com/animals/wild-life>

– Athena Dinar

Rothera vs JCR Football Report

BAS sports

On a glorious sunny evening in December, Rothera FC played host to the visiting JCR football team with a good turn out from both sides. The JCR had a multinational team from the Home Nations, Chile, Italy and Norway. After a warm-up with a few toe punts, the game kicked off.

With a slight breeze favouring the home side in the first half, they used this to their advantage and pressed the JCR defence regularly with some testing moves down the right flank. JCR responded well with some down-the-middle counter-attacks, led by the big Scotsman playing a great holding role laying off balls to the more agile of runners in the team.

The deadlock was broken midway through the first half when Rothera took the lead through a well executed move, straight off the practice ground.

Some brave goalkeeping and excellent defensive tackling from JCR kept the game alive but not long before half time, Rothera increased their lead with a great shot from an acute angle to make it 2-0.

At half time, JCR produced the oranges for both teams only to be told they couldn't be consumed by the hangar but ok in the bar. Oranges were put on hold till after the game! A brisk start by JCR after the break saw two quick goals from some great forward running and pressure to level it at 2-2. With 15 minutes to

go, a pugilistic challenge on one of Rothera's star forwards by the JCR keeper resulted in a penalty (and a sore head) which was dispatched with ease. With JCR tiring, a defensive error led to a neatly-executed Rothera goal to make it 4-2 at the final whistle.

The game was played in great spirits and thoroughly enjoyed by all. The post-match analysis carried on for many hours in the hospitality suite provided by the home team. A big thank you to Rothera and we look forward to the return leg.

– Steve Amner



▲ The teams played out a high-quality match in glorious conditions

Space Sounds In Elite Dangerous



▲ Image courtesy of Elite Dangerous/Frontier Developments

Our amazing, natural 'sounds of space', recorded by the VLF receiver at Halley Research Station in Antarctica, have been incorporated into the new exploration gameplay in popular video game Elite Dangerous, released on 11th December 2018.

In this collaboration BAS Space Weather Researcher Nigel Meredith worked with Frontier Developments, the creators of Elite Dangerous,

to incorporate the eerie sounds into the game. In any one of over 400 billion stellar systems, players can now use a new analysis mode to discover more about their surroundings.

The new mode, called the Full Spectrum System Scanner, features the simulated sounds of radio emissions from exoplanets in remote stellar systems based on the Halley VLF recordings.

– Nigel Meredith

Staff Survey Completed

Thank you very much to everyone who took part in the 2018 BAS Staff Survey. This two-yearly exercise is an opportunity for staff to comment on all things BAS, the good and the bad, and for those comments to be heard. This year we had a grand total of 188 responses.

We have been analysing the results and will share them with senior staff at the BMT in April. Subsequently a summary will be shared with all, and the main issues arising from the survey will form an action grid for the Staff Forum to discuss, and to use in working with senior management to address people's concerns.

– Laura Gerrish



NERC Fellowship – Back At BAS

I was awarded a NERC Independent Research Fellowship (IRF) in May 2018. I previously held a NERC Postdoctoral Fellowship at BAS (2012-15), so this is my second fellowship here. Competition for IRF funding is strong, and it took me three attempts to be successful, but my persistence paid off.

The funding is now enabling me to return to BAS and restart my scientific career, after an absence of several



▲ Ingrid has returned to BAS

Biosecurity – Playing Your Part

Moving non-native species into and around Antarctica presents one of the greatest threats to the continent's biodiversity, and it is an offence under the UK Antarctic Act. To help us reduce the risk of species introductions, new BAS Biosecurity Regulations have been issued, which include mandatory biosecurity procedures (for more detailed information see: <https://www.bas.ac.uk/wp-content/uploads/2018/12/BAS-Biosecurity-Regulations-2018-FINAL.pdf>).

In addition, Biosecurity Stations and smaller Biosecurity Kitbags, both consisting of vacuum cleaners and cleaning equipment, are now being installed at BAS Cambridge, and are already

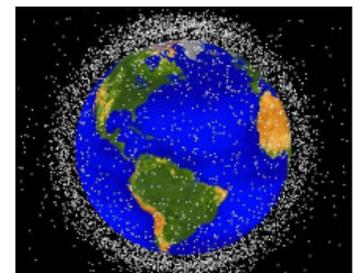


available on the research stations, ships and gateway ports. Please use them to keep all south-bound clothing and cargo free of biological material.

When travelling south, please remember: **Don't pack a pest. No bugs! No seeds! No soil!**

– Kevin Hughes & Kate Morley

BAS staff



▲ Space debris (Image: NASA)

altitude) model simulations to quantify how this influences the climate of the upper atmosphere.

I will also work with the University of Southampton to determine how expected climatic changes in thermosphere density will affect the future evolution of the space debris population to inform decision-making on mitigation strategies. I am looking forward to starting this exciting project, and building new links and collaborations, both within BAS and beyond.

– Ingrid Cnossen

BAS Cambridge Marine Aquarium Project

BAS facilities



▲ An artist's impression of the new aquarium facilities

The new Cambridge Marine Aquarium project is underway. This is an exciting project to replace the ageing and inefficient cold room facilities which were installed in 2002. The project has been split into two phases; the first includes the replacement of the cold room structure and associated refrigerating equipment. This is an opportunity for a much improved facility which will see

a big reduction in sea-water handling and therefore less heavy work for the aquarium staff!

Phase 2 will see the replacement of the cold storage facilities which house the current catalogue of marine and terrestrial samples collected from various places around the continent. Funding has just been confirmed

for 2019/20 and work is anticipated to start early in the new financial year.

The aquarium and cold rooms' refurbishment is the highest priority project under the Cambridge Carbon Management Plan. It is expected to deliver more than a 45% reduction in carbon emissions from the area, equal to 55 tonnes of CO₂e per year. This significant improvement is the outcome of replacing conventional cooling and refrigeration systems with more environmentally friendly solutions rather than using HFCs, characterised by the high global warming impact if they were to be released to the atmosphere.

The project will deliver an improvement in energy efficiency due to:

- Improved sizing of the

- cooling and refrigeration system
- Integration of heat recovery to supplement hot water demands of the site
- New insulated sea-water storage
- Increased insulation levels for the aquarium and cold rooms

A new energy-metering system will also add real-time data to the existing Cambridge metering system so savings will be there for all to see!

– Andy Binney & Nopi Exizidou



▲ BAS Cambridge aquarium

Comms Team Visit To AWI

BAS has several collaborations with the Alfred Wegener Institute (AWI), Germany's polar operator in Bremerhaven, so in December I visited the Communications Team to discuss promoting big projects like the Larsen C Cruise, MOSAIC and Beyond EPICA.

AWI has buildings across the city, near to where their ships, including *Polarstern*, are berthed. The Institute has over 1,000 staff and a budget of around €110M per annum. The Communications Team of 10 have a three-storey red brick 'press house' with offices and meeting rooms.

– Athena Dinar



▲ AWI's 'press house'

New EU Funding & NERC Grants

The end of 2018 brought good news and new grants. We offer our congratulations to those with successful grants from eight different funding bodies worth over £3.5M.

EU Funding

A Brearley, A Meijers – CNRS led. SO-CHIC: Southern Ocean Carbon and Heat Impact on Climate.

A Fleming – Athens University led. ExtremeEarth: From Copernicus Big Data to Extreme Earth Analytics.

A Jenkins – Bergen University led. TiPACCs: Tipping Points in Antarctic Climate Components.

J Wilkinson, E Ford – Met Norway led. KEPLER: Key Environmental monitoring for Polar Latitudes and European Readiness.

L Sime – Niels Bohrs Institute led. TiPES: Tipping Points in the Earth system – Towards

sharper estimates of critical forcing levels and associated impacts.

R Mulvaney – CNR led. BE-OIC: Beyond EPICA Oldest Ice Core: 1.5 million years of greenhouse gas – climate feedbacks.

NERC Highlight Topics

A Jones, T Lachlan-Cope, A Kirchgaessner – Birmingham University led. SEANA – Shipping Emissions in the Arctic and North Atlantic atmosphere.

E Shuckburgh, S Hosking – Exeter University led. Emergence of Climate Hazards.

Diverse funding

AHRC: L Sime – Westminster University led. Materializing data, embodying climate change.

Alan Turing Institute: E Shuckburgh with AIC, MAGIC, PO teams – BAS led. Machine learning projects.

BAS funding

Antarctic Wildlife Research Fund: *S Hill – BAS led.* The role of fish in the Scotia Sea foodweb.

Darwin Plus 7: *R Phillips – BAS led.* Seabird sentinels: mapping potential bycatch risk using bird-borne radar.

ESA: *A Fleming – Polar View led.* Polar Thematic Exploitation Platforms 2.

STFC: *R Horne, E Woodfield, S Glauert – BAS led.* Electron acceleration and loss at Jupiter and Saturn.

– Ana Pereira O'Callaghan



ESA South Georgia Satellite Image

This stunning satellite image of South Georgia, from the Copernicus Sentinel-2 satellite, featured on the European Space Agency's December 'Earth From Space' weekly video programme.

The content talked about the discovery of the island,

its topography, climate and wildlife, and also BAS science and operations at Bird Island and King Edward Point Research Stations. You can watch the short video here: http://www.esa.int/spaceinvideo/Videos/2018/12/Earth_from_space_South_Georgia_Island – *Jamie Oliver*



▲ The photo shows the whole island in stunning detail (Image: ESA)

Antarctica Week 2018

Over 30 BAS volunteers inspired over 4,500 young people about Antarctica with a 45-minute Q&A session via phone or Skype during Antarctica Week (3rd-7th December). Throughout the week, over 50 schools discovered the importance of Antarctic science and operations (with a special focus on the Int. Thwaites Glacier Collaboration).

Thank you to all volunteers at BAS Cambridge, Rothera, Bird Island, King Edward Point and onboard the JCR and the Shackleton for volunteering! – *Layla Batchellier*



▲ Talking Antarctic science

BAS Estates Team Update



▲ Before

Since October, projects and improvement works to the Cambridge site have really ramped up! As you may have seen, we currently have three major projects in progress; the aquarium replacement, SBI toilets and shower room refurbishment, and the solar PV carpark. Many smaller projects are happening too.

The following is a summary of what is currently happening:

- SBI toilets and shower room refurbishment – phase one is complete with phase two making great progress
- Whole-site electric power

Non-Native Species On Horizon



▲ Representatives from nine nations attended the workshop

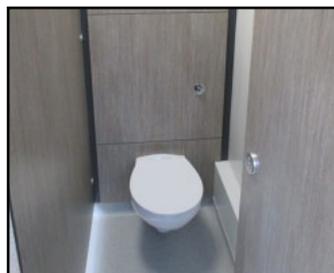
In October, a horizon-scanning workshop was held in Cambridge to identify which non-native species might invade the Falkland Islands, South Georgia, South Sandwich Islands and the British Antarctic Territory in the next decade. BAS environmental managers and scientists joined experts from nine nations in this workshop sponsored by the GB Non-native Species Secretariat (DEFRA) and organised by Prof Helen Roy (CEH).

A long list of marine and terrestrial species was considered and the highest-risk species identified. Just as importantly, the workshop allowed environmental managers from BAS, the Falkland Islands Government and the Government of South Georgia and South Sandwich Islands to discuss how they can work together to protect these spectacular, but vulnerable, Overseas Territories from invasion. – *Kevin Hughes*

BAS estates

- Hazard Bay refurbishment – replacement of doors, gate modification, a lighting upgrade plus various other works to bring the area up to modern standards
- Containers in the mast area – providing weatherproof temporary storage
- Site condition upgrade works – asbestos removal in parts of Logistics, repairs to SB2 roof and fire protecting walls in SBI
- F-gas removal – replacement of refrigerant gas from freezer and chilled plant around site to a more environmentally-friendly equivalent

Please take care around site as there is a lot of work happening at the moment. If you have any questions about the current projects or have any ideas for project in the future please contact Cambridge Estates. – *Sam Smithson*



▲ After

down – a power down will be required towards the end of Jan/early Feb (date t.b.c.). This is required to install new power requirements for the aquarium and solar PV carpark, as well as to carry out essential repairs and statutory maintenance and testing to the site's electrical system. Estates are currently working with science and operations teams to ensure disruption is minimised. If you have any questions or concerns please check with your Team Leaders or contact Sam Smithson (samith@bas.ac.uk)

Bird Island Station Upgrade

Photos from this season show the newly-refurbished Bird Island Research Station and what a good job was done last year with construction of Beck House and other significant upgrades around the site.

– Jamie Oliver



▲ Beck House (right) at BI

Biodiversity@BAS Update



▲ The common blue butterfly

As we settle into winter, it seems a good time to reflect on some of the activities organised by Biodiversity@BAS over the last year.

We trialled a nestbox camera for the first time, which successfully recorded the nest preparation, egg laying and fledging of 10 blue tit chicks on the 30th May. The footage was livestreamed and can be re-watched on the BAS YouTube channel. We look forward to seeing our returning blue tits or new bird visitors next year! For a second year in a row, on 27th July, we coordinated

a butterfly count on the BAS Cambridge site. This was part of a citizen science activity led by the Butterfly Conservation. It was a lovely warm, sunny day (perfect for butterfly counting) and we had a great turn out, with 25 staff joining in. We carried out counts across nine sites for 15 minutes each.

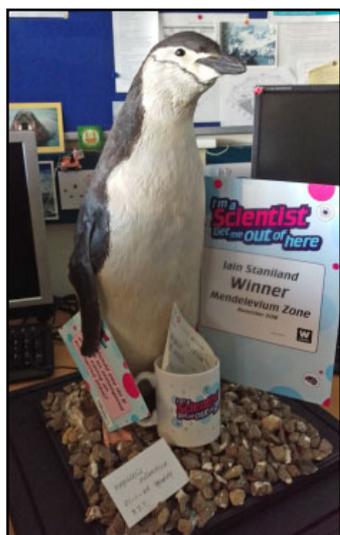
A total of 73 individual butterflies (up to nine species) were spotted including: small and large white, meadow brown, tortoiseshell, common blue, red admiral, holly blue, gatekeeper and green-veined white. The common blue and the large white had over 20 sightings each. We sent in our data to the Butterfly Conservation via their www.bigbutterflycount.org campaign. In total, across the UK, 100,246 people took part in a UK-wide butterfly count completing 97,133 counts.

BAS Cambridge

Throughout 2018, BAS volunteers took part in 14 organised work parties, contributing to the biodiversity conservation of the Cambridge site. Activities included litter picking, clearing cut grass, raking up leaves and branches from the East Meadow, cutting back brambles or planting wild flowers, amongst many others.

Everyone is welcome to join and no previous gardening or biodiversity expertise is required! It is a chance to get away from your desk and meet new people from across the organisation whilst enjoying some time being active outside. Thanks to all for their time and energy in 2018! To find out more, join the BAS Biodiversity Office365 group, or visit https://ishare.apps.nerc.ac.uk/teams/bas_biodiversity/SitePages/Home.asp.
– Anna Malaos

‘I’m A Scientist’ Event Winner!



▲ A friendly chinstrap penguin

During November I took part in the ‘I’m A Scientist’ outreach event where schools connect with scientists in an X-Factor-style competition, and the students themselves vote for their favourites. Scientists are placed in zones based on their interests (I was in a general science zone) and answer questions from students either

posted online or during fun, frantic 30min, text-based chats. Each day during the second week of the event the scientist with the least overall votes is evicted (but can still participate) until the winner is announced and given a £500 prize to communicate their work to the public and a mug!

After an intense fortnight involving 24 live chats and 132 posted questions ranging from “What’s your favourite animal?” to “Do aliens exist?” I was lucky to be crowned the winner. My intention is to use the prize money to highlight our acoustic monitoring work and the issue of underwater noise pollution through an ongoing collaboration with the sound Artist Emma Critchley.

It was great fun and a brilliant experience. I learnt so much myself having to research some of the more esoteric questions. The format is clever

BAS outreach

and really draws you in with the evictions getting tenser each day. Hopefully together with the rest of the fantastic scientists involved we will have inspired a new generation of students to consider a career in science or at least to appreciate what it is all about.

I am happy to chat with anyone who would be interested in taking part in future rounds. For more information see: www.imascientist.org.uk
– Iain Staniland



▲ Iain Staniland – winner

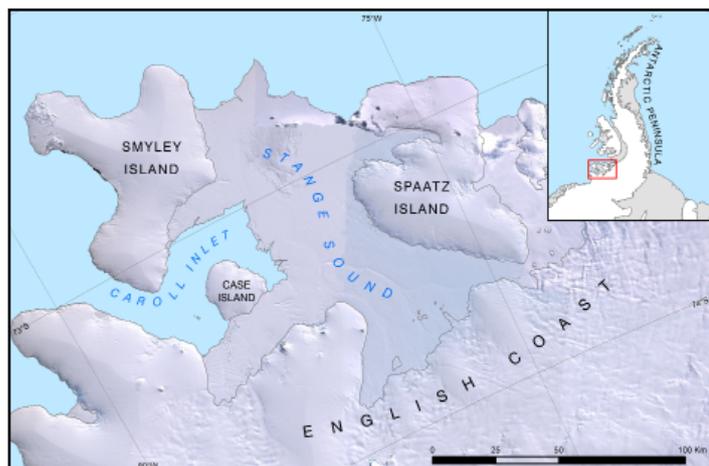
Spotlight On Science: Oct '18

Evidence for the long-term sedimentary environment in an Antarctic subglacial lake

Subglacial lakes beneath the Antarctic Ice Sheet remain one of the few unexplored environments on the planet. Until we can access them, we can only use remote techniques to infer what secrets they may hold. Seismic sounding is one such technique, and this paper reports seismic investigations of Subglacial Lake Ellsworth which sits beneath 3.2km of ice. It reveals a surprisingly detailed picture of the lake with a lake bed covered in fine-grained sediment, the layering of which suggests very slow accumulation. The study shows that the prize of drilling into subglacial lakes will be a long history of the ice sheet.
– Andy Smith

Place-Name Of The Month – #46

Antarctica



▲ The English Coast will see BAS activity for the Thwaites project

The International Thwaites Glacier Collaboration project ship relief will take place during the new year with equipment and fuel being offloaded at the English Coast. This area was first mapped on the ground by the United States Antarctic Service (USAS, now USAP) in 1940, and named for the organisation's

Executive Secretary, Capt Robert A J English.

Stange Sound was first photographed and mapped by the Ronne Antarctic Research Expedition (RARE) in 1947, and named for Henry Stange, a contributor to the expedition. Carroll Inlet, where the ship relief is planned to be, was

first observed from the air in 1940, and named from Arthur J Carroll, Chief Photographer at the expedition's 'East Base'.

Nearby, Case Island (77° 57'35"W, 73° 14'57"S) is actually an ice rise in the Carroll Inlet itself, and was named for Francis S Case, who obtained Government support to provide a ship for RARE. In the same vein, Spaatz Island (75° 06'48"W, 73° 11'38"S) is named for General Carl Spaatz, Commanding General of USAAF, who arranged for provision of aircraft for RARE.

If you would like to know more about the Place-names Committee or submit a place-name for consideration in the next meeting (May 2019), then please have a look at the website here: www.apc.antarctica.ac.uk
– Elena Field

New Polar Worlds Gallery

BAS has a partnership with the National Maritime Museum in Greenwich, which has culminated in BAS content featuring in its new Polar Worlds gallery. It is one of four new spaces, and BAS features throughout the Antarctic section, from the modern clothing exhibit and Julie Baum's wedding dress to sea spider specimen and fishing hooks. As you enter you are welcomed by penguin scientist Harriet Clewlow talking about what it's like to live and work in Antarctica and many images by Pete Bucktrout.

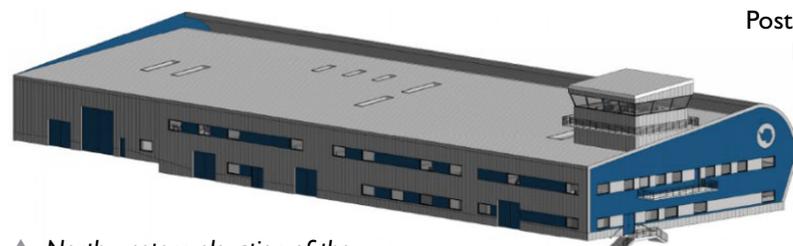
– Athena Dinar



▲ Some of the BAS exhibits

Rothera Modernisation Update

BAS stations



▲ North-western elevation of the New Scientific Operations Vehicles and Estates Building

Following completion of the Developed Design and Works Information for the Rothera Modernisation project, a BAS drop-in session was held on 17th December to present the design strategies of the Phase I new Scientific Operations, Vehicles and Estates Building and the site-wide services.

Representatives from our technical advisor, Ramboll; architect Norr; contractor BAM, and their designers, Sweco, spoke on how the design will deliver benefits to BAS in ways of working, energy efficiency, and enhanced resilience.

A 3D fly-through was also presented, giving a detailed impression of two important spaces within the new building; the Field and Science Preparation area, and the Central Store.



▲ VR headsets at the drop-in

Poster boards included the latest designs, layouts, elevations and construction drawings reflecting the work and consultation with BAS conducted in the concept and developed design. These poster boards are currently located outside the AURORA Conference Theatre for anyone who could not make the drop-in session.

The contractor, BAM, and their design engineers, Sweco,

are now working on the Detailed Design and Target-Cost Design, which is based on the Works Information published by Ramboll in December 2018.

Further visualisations and virtual reality models will be developed later this year so that BAS can further understand how we will work in the new building and enable us to contribute, with our partners, to developing the design.

– David Brand



▲ 3D visualisation of the Field and Science Preparation Area

New MSCA Fellows Start At BAS Cambridge

BAS Fellows



▲ (l-r) Louis, Lara and Irena

We have recently welcomed three Marie Skłodowska-Curie (MSCA) Individual Fellows (IFs) to BAS. The goal of IFs is to enhance the creative and innovative potential of experienced researchers wishing to diversify their individual competence in terms of skill acquisition through advanced training, international and intersectoral mobility. Here is a brief overview of their projects:

Louis-Alexandre Couston (MIMOP – European Fellowship)
I work on the ‘Modelling Ice-shelf Melting and ice-Ocean Processes’ project (MIMOP). MIMOP’s main goal is provide accurate ice-shelf melt rates for various background ocean conditions (e.g. stratification). What’s new is that my simulations will include both the turbulent ocean dynamics and the slow evolution of the rough ice-ocean interface, without any parameterisations.

I will use the state-of-the-art direct numerical simulation code Dedalus. Dedalus is an open-source user-friendly fully-spectral code, which can solve almost arbitrary systems of partial differential equations. Stay tuned if you’re interested in a spectral code as I will soon give a presentation about Dedalus and how to use it on SciHub.

Irena Vankova (DOVufRIS – European Fellowship)
My MSCA individual fellowship project at BAS aims to detect and investigate oceanic variability in the Filchner-Ronne Ice Shelf cavity. In particular, I will analyse measurements collected with a high-accuracy phase-sensitive radar (ApRES, developed at BAS) to understand basal melt-rate temporal variability and its changes from site to site across the ice shelf. In the next phase of the project, I will use a high-resolution ocean model to investigate physical processes governing these observations.

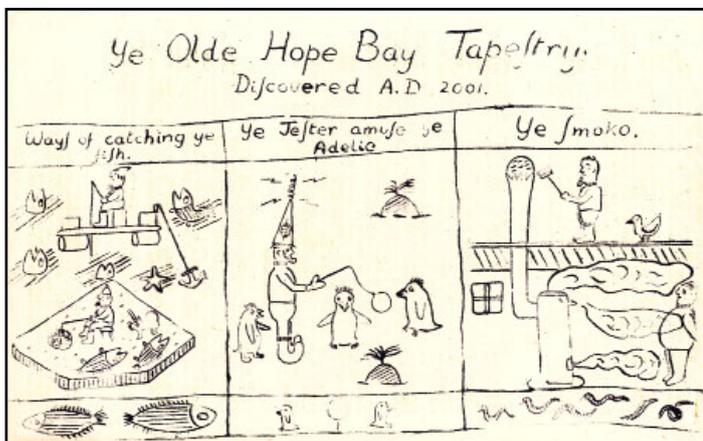
This work will collaborate with colleagues at the Alfred Wegener Institute (Germany), the Bjerknes Centre for Climate Research (Norway), and the Australian Antarctic Division (Australia).

Lara Perez (WAMSISE – Global Fellowship)
I am marine geophysicist focused in the seismic stratigraphic analysis of oceanic basins and continental margins of the Polar Regions. I will be working on the Global-MSCA WAMSISE – West Antarctic Margin Signatures of Ice Sheet Evolution.

WAMSISE is a three-year project, working in Italy, New Zealand and at BAS. It aims to analyse the stratigraphic architecture of the sedimentary record along the West Antarctic Margin from the Ross Sea to the Antarctic Peninsula, with particular focus on the post-early Miocene evolution, in order to decipher the history of interactions between tectonic, climatic, oceanographic and cryospheric processes.
– Nicola Munro

Pictures From The BAS Archives

Archive Image #73



▲ An illustration from *The Hope Bay Howler* by I M Lamb, Christmas, 1945 (Ref:AD7/D/3/1/1945/7)

The base magazine has long been a feature of wintering life at BAS. Eric Back, Medical Officer for Operation Tabarin recalls how it all began in 1944:

“...[E]verybody knows about Scott’s South Polar Times, and we felt that we ought to do something and in the first year we had *The Port Lockroy Prattler*, which never got properly going, ‘cause we didn’t

have anybody who had any journalistic art at all.

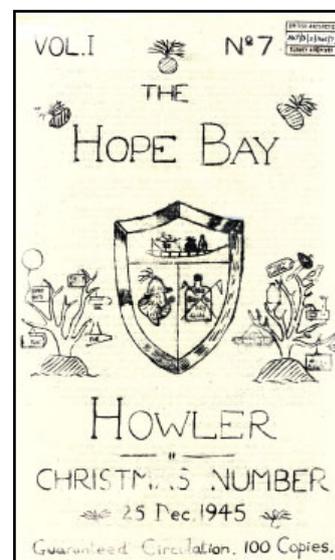
But the second year, David James was the leading light inspiring the *Hope Bay Howler*. Lamb was a masterly artist, who drew the back-plates, which are very good examples of Antarctic life...

We had a lot of fun with this... the first edition came out for

Midwinter’s Day in June ’45...

I then volunteered to be editor thereafter and I couldn’t type, so I was taught to type, and we produced from June ’til December ’45 – and we had articles from our people in Deception, and the people in Lockroy.”

– Kevin Roberts



▲ Christmas edition from 1945

And Finally...



▲ An impressive effort indeed

The BAS Christmas lunch was a fine spread of all the usual seasonal favourites and very much enjoyed by all who attended. The traditional practice of the BAS Leadership Team adopting serving duties in fancy dress was upheld. The most striking of these was BAS Director of Science David Vaughan, whose Halley VI headpiece stole the show. The white ‘ice sheet’ cape came complete with Halloween Crack (enough said).
– Jamie Oliver

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