News story: SpaceX delivers UK missions to International Space Station

International Space Station. Credit: NASA.

In the cargo hold is a UK-built satellite that will test different approaches to removing space junk from the Earth's orbit, as well as an international science package to study powerful lightning from space.

Led by the University of Surrey, built by the world's leading small satellite manufacturer Surrey Satellite Technology Limited, and with technology on board designed by Airbus, the RemoveDEBRIS mission will experiment with cost effective technologies that could be used to tackle the problem of space junk.

Science Minister Sam Gyimah said:

"Space debris is one of the key challenges we face and it's great to see a British university and some of our innovative space companies leading the way on the search for solutions. It's also a fantastic example of the unique expertise found in the UK's growing space sector and the value that it adds to international projects.

"The UK Space Agency continues to work closely with industry to develop new technologies and infrastructure to grow our share of the global space market as part of the Government's industrial strategy."

The RemoveDEBRIS satellite will be deployed from the International Space Station and attempt to capture simulated space debris using a net and a harpoon, while also testing advanced cameras and radar systems. Once those experiments are complete, it will unfurl a drag sail to bring itself and the debris out of orbit, where it will burn up as it enters the Earth's atmosphere.

The experiment is important as there are thousands of pieces of space debris circulating the planet – many travelling faster than a speeding bullet – posing a risk to valuable satellites and even the International Space Station itself.

Professor Guglielmo Aglietti, Director of the Surrey Space Centre at the University of Surrey, said:

"It is important to remember that a few significant collisions have already happened. Therefore, to maintain the safety of current and future space assets, the issue of the control and reduction of the space debris has to be addressed.

“We believe the technologies we will be demonstrating with RemoveDEBRIS could provide feasible answers to the space junk problem – answers that could be used on future space missions in the very near future.”

Also on board the SpaceX Dragon capsule is a science experiment known as the Atmosphere-Space Interactions Monitor (ASIM), which will study high-altitude lightning above severe thunder storms. Scientists are interested in these electrical discharges which can produce bright colours – sometimes called red sprites and blue jets – as they can alter the chemistry of the stratosphere and potentially affect the Earth’s climate. ASIM is travelling to the International Space Station in the trunk compartment of the Dragon capsule. Once it arrives, the station’s robotic arm will transfer the payload from the capsule to the external payload facility on the European Space Agency’s (ESA’s) Columbus module.

Dr Martin Fullekrug, the lead UK scientist on the project based at the University of Bath, said:

“I have been researching and investigating space and lightning events for over 15 years and the launch of ASIM feels like the pinnacle of my journey into understanding this phenomenon.

“This is the first time such a detailed and technologically-advanced measurement device will be flown into space to observe lightning and will hopefully provide us with new knowledge about how lightning is initiated and how the properties of lightning can affect our daily lives in so many different ways.”

The experiment, part funded by the UK Space Agency through our investment in ESA and built by the Danish company Terma, will be operated by ESA with involvement from scientists in the UK.

Dr Graham Turnock, Chief Executive of the UK Space Agency said:

“This experiment will give scientists all over the world the opportunity to study the effects of powerful lightning storms from the unique vantage point of the International Space Station. It’s another exciting moment for international space collaboration and commercial spaceflight, which the UK Space Agency supports through the Government’s Industrial Strategy.”

Press release: Government confirms UK ban on ivory sales

The UK will introduce a ban on ivory sales, Environment Secretary Michael Gove confirmed today as he set out our plans to help protect elephants for future generations.

The Government is publishing the response to its consultation on a UK ivory sales ban, and confirming robust measures that will be brought into force through primary legislation.

The ban will cover ivory items of all ages – not only those produced after a certain date. The maximum available penalty for breaching the ban will be an unlimited fine or up to five years in jail.

There were more than 70,000 responses to the consultation, with over 88 percent of responses in favour of the ban.

The number of elephants has declined by almost a third in the last decade and around 20,000 a year are still being slaughtered due to the global demand for ivory.

Environment Secretary, Michael Gove said:

> Ivory should never be seen as a commodity for financial gain or a status symbol, so we will introduce one of the world's toughest bans on ivory sales to protect elephants for future generations.
>
> The ban on ivory sales we will bring into law will reaffirm the UK's global leadership on this critical issue, demonstrating our belief that the abhorrent ivory trade should become a thing of the past.

In line with the approach taken by other countries, including the United States and China, there will be certain narrowly-defined and carefully-targeted exemptions for items which do not contribute to the poaching of elephants.

The exemptions have been tightened since the Government published its proposals for consultation, but still provide balance to ensure people are not unfairly impacted:

- Items with only a small amount of ivory in them. Such items must be comprised of less than 10% ivory by volume and have been made prior to 1947.
- Musical instruments. These must have an ivory content of less than 20% and have been made prior to 1975 (when Asian elephants were added to CITES).
- Rarest and most important items of their type. Such items must be at least 100 years old and their rarity and importance will be assessed by specialist institutions such as the UK's most prestigious museums before exemption permits are issued. In addition, there will be a specific exemption for portrait miniatures painted on thin slivers of ivory and which are at least 100 years old.
- Museums. Commercial activities to, and between, museums which are accredited by Arts Council England, the Welsh Government, Museums and

> Galleries Scotland or the Northern Ireland Museums Council in the UK, or the International Council of Museums for museums outside the UK.

By covering ivory items of all ages and adopting these narrow exemptions, the UK's ban will be one of the toughest in the world. The US federal ban exempts all items older than 100 years as well as items with up to 50% ivory content. The Chinese ban exempts ivory "relics", without setting a date before which these must have been produced.

The UK is already showing global leadership in the international fight against the illegal ivory trade, and at a recent European Environment Council called for EU member states to follow the Government's lead and ban commercial trade in raw ivory – which is already banned in the UK – within the EU as soon as possible.

In October, the UK will host the fourth international conference on the illegal wildlife trade, bringing global leaders to London to tackle the strategic challenges of the trade. This follows the ground breaking London 2014 conference on the illegal wildlife trade, and subsequent conferences in Botswana and Vietnam.

A ban on ivory sales in the UK would build on government work both at home and overseas to tackle poaching and the illegal ivory trade. The UK military is training African park rangers in proven poacher interception techniques in key African countries, and Border Force officers share their expertise in identifying smuggled ivory with counterparts worldwide to stop wildlife trafficking.

The CEO of Tusk Trust, Charlie Mayhew MBE said:

> We are delighted that the Government has listened to our concerns and given the overwhelming public response to their consultation is now moving decisively to introduce tough legislation to ban the trade in ivory in the UK.
>
> The narrowly defined exemptions are pragmatic. The ban will ensure there is no value for modern day ivory and the tusks of recently poached elephants cannot enter the UK market. We welcome the fact that Ministers are sending such a clear message to the world that the illegal wildlife trade will not be tolerated and every effort will be made to halt the shocking decline in Africa's elephant population in recent years.

Tanya Steele chief executive at WWF said:

> Around 55 African elephants are killed for their ivory a day, their tusks turned into carvings and trinkets. This ban makes the UK a global leader in tackling this bloody trade and it's something WWF

> has been fighting hard for.
>
> But if we want to stop the poaching of this majestic animal, we need global action. We hope the UK will continue to press countries where the biggest ivory markets are, most of which are in Asia, to shut down their trade too.

ZSL Director of Conservation, Matthew Hatchwell, said:

> Legal domestic ivory markets are intrinsically linked to the illegal ivory trade that is driving the current poaching crisis. With almost 20,000 elephants poached in the last year, it is vital that countries take significant steps such as those outlined by the UK government today to close their markets and help make the trade in ivory a thing of the past. No one in the UK today would dream of wearing a tiger-skin coat. Thanks to this move, in a few years' time we believe the same will be true for the trade in ivory.

John Stephenson, CEO Stop Ivory said:

> This is a significant day for the future of elephants. The UK government has taken a momentous step. The proposed ban, with its narrow and clear exemptions, places the UK at the forefront of the international determination to halt the extermination of elephant populations by banning trade in ivory. The Secretary of State for DEFRA has shown clear leadership in demanding legislation whilst there is still time to secure a future for elephants in the wild.
>
> The end of the ivory trade in the UK removes any hiding place for the trade in illegal ivory, and sends a powerful message to the world that ivory will no longer be valued as a commodity. Ivory belongs on an elephant and when the buying stops the killing will stop.

As profits become ever greater, the illegal wildlife trade has become a transnational organised enterprise, estimated to be worth up to £17 billion a year.

The further decline of elephants would also deprive some of the poorest countries in the world of their valuable natural capital, affecting economic growth and sustainable development.

News story: MAIB safety digest 1/2018 published

Speech: Flying through Fire and Ice

On the occasion of the 95th anniversary of Chile's Naval Aviation, including commemoration of 50 years since the evacuation of British and Chilean scientists from Deception Island.

'Antarctica – where it is possible to see the splendours and immensities of the natural world at its most dramatic', so said Sir David Attenborough, our leading broadcaster in the recent television series 'Blue Planet'.

Drama was certainly seen by those on Deception Island, over 50 years ago. The British base had been occupied since Feb 1944, but on 5 Dec 1967, there had to be a temporary evacuation, after volcanic eruptions. The scientists returned but had to evacuate again in February 1969 when further eruptions damaged the station buildings. The only previous report of volcanic activity had been in 1842.

In 2016 we celebrated together the centenary of the rescue of Shackleton's men from Elephant Island by Chile's Piloto Pardo in the steamer Yelcho. In 1967, and 1969, it was ships named after that important part of our shared history, that came to the aid of the British and Chilean personnel, stranded on Deception Island.

My colleagues at the British Antarctic Survey have looked back in the archives to find some of the first hand accounts of that time, 50 years ago, and the appreciation of the help from Chile.

The accounts of 1967 relay the heavy ash and poor visibility, and record the concerns about both the Chilean and Argentine bases on the Island. The 27

Chilean personnel were able to join the 15 men at the British base after a very difficult and dangerous journey. The buildings were covered in c. 1 foot of ash and hail. The heavy and rapid rise and fall of the water in the bay meant it was not possible for the Chilean ships – Piloto Pardo and Yelcho – to reach the Island. Helicopters were sent from the Piloto Pardo to effect the evacuation. The report states:

> An extremely fine show of flying skill and efficiency had been given by the Chilean Navy.

In 1968 scientists returned to examine a new island which had appeared as a result of the 1967 eruption. But on 5 February 1969 there was a further evacuation because of heavy tremors. The account reads:

> Two helicopters from Piloto Pardo arrived through ash and wet snow cloud and picked up whole party and returned them to ship. Landing on ship was extremely difficult as cockpit dome was completely obscured by ash and wet snow. A heavy sea was also running with 30 knot wind… All on board consider rescue efforts by the Chileans a superb example of skilful seamanship and flying carried out under appalling conditions.

Today, the Antarctic Treaty System, our collaboration, and the science being undertaken in Antarctica is more important than ever. Through the Scientific Research Memorandum of Understanding, with INACH, signed when President Piñera visited London in 2012, BAS scientists have extensive collaborative links with Chilean scientists, involving joint activities in Antarctica, the Southern Ocean and in and around Chile. The projects include investigating aspects of glaciology, physical and biological oceanography and marine and terrestial ecosystems.

Just a few weeks ago the Chilean authorities helped ensure the smooth transit of vital and unique science instrumentation to move from Antarctica to Iceland. The equipment had been used as part of a collaboration between BAS and the University De Santiago, and funded by INACH, on a joint project to measure atmospheric conditions over Chile’s stations at Marsh. It was then transferred to be used on a polar plane, as part of a major international collaboration, to measure atmospheric conditions in the northern hemisphere. This work will yield important insights into climate change.

Those working in Antarctica face many hazards and arduous conditions. Thank you to those pilots of the Armada de Chile, who 50 years ago flew through fire and ice, illustrating the great spirit of collaboration and commitment of all those involved in one of the most beautiful, but harshest places on the planet. Thank you to all those who work in Antarctica to preserve this special place for the benefit of all and to to help us understand the world around us.

We are building a new polar research ship – named appropriately the RRS Sir

David Attenborough. The facilities on board will transform ship borne science in the polar regions, and I hope some of those insights will be through further collaborations between the UK and Chile.

News story: MOD confirms death of Lance Corporal George Partridge

Lance Corporal George Partridge.

Lance Corporal George Partridge joined the Army on 13th June 2010 at the age of 19.

After completing his basic training at Bassingbourn in Cambridgeshire, where he was awarded the prize for Fittest Recruit, he moved to 3 Royal School of Military Engineering Regiment at Minley in Surrey for combat engineer training, and from there to Leconsfield for vocational driver training, qualifying as a Military Engineer (Driver) in April 2011.

His first years in the Army were spent at 21 Engineer Regiment in Ripon, North Yorkshire, where he qualified as a Class 1 Royal Engineer Driver and deployed to Afghanistan on Operation HERRICK 17 in 2012-13. Successfully selected for promotion he moved to 26 Engineer Regiment in Perham Down, Wiltshire where he served as a motor transport Lance Corporal within 38 Headquarters and Support Squadron. He was responsible for allocating drivers to tasks on daily driving details as well as scheduling maintenance and repairs for the Regiment’s large fleet of wheeled vehicles.

Popular and hard-working, Lance Corporal Partridge was at the hub of the Regiment and was always to be seen out in the vehicle park ensuring that his vehicles were in good condition and ready for the next task. A genuine expert in the complex area of motor transport management, he was well known across the Regiment for his frank advice and his ability to find a vehicle for every last-minute important job.

Whilst at 26 Engineer Regiment he deployed to Canada, supporting armoured engineer training and construction exercises as well as deploying in support of UK operations. He recently achieved a long-held ambition to commence training as an Army diver, successfully completed his Junior Commanders Course, and had just been selected for promotion to Corporal.

Lance Corporal Partridge loved sport and fitness. A regular in the Regiment’s Gym every evening, he was also a talented sportsman who had represented the Regimental Rugby Team and the Army as part of the Under 23 Army Football squad. He also tried his hand at luge ice sports where he represented the Corps.

The loss of such a popular and capable soldier is hard felt by his Squadron, the Regiment and the Corps, as well as everyone in the wider Army who had the privilege of working with him. He will be remembered fondly by his many friends and colleagues throughout the Corps. He leaves behind his wife Zoe, who is expecting their first child, parents Alyson and Stephen and siblings Lucy and Ben.

Armed Forces Minister Mark Lancaster said:

> It is with great sadness we must confirm the death of Lance Corporal George Partridge. It's clear from the testaments of his colleagues that he had a bright future in the Army and was held in the highest regard. Our thoughts are with his family and friends at this extremely difficult time.

Lance Corporal Ash Skerten said:

> If I could be half the man he was I would be proud, he was the best soldier.

Corporal Anthony Matthews said:

> George was a motivated and determined individual, who was a role model to all those around him. His peers also looked up to him and would come to him for advice. He was a family-orientated man who was looking forward to starting his family with wife Zoe. He was both a physically and mentally fit person who relished any challenge thrown in his direction.

Sergeant Chris Brignull said:

> I have had the honour and pleasure of knowing LCpl George Partridge for well over 2 years now, from the start he was an outstanding character and a great role model for younger Sappers within the troop.
>
> George had a very calm and collected approach to everything he did, robust and professional during all tasks put his way, which he always tackled head on. He was a true leader and had the potential to progress through all ranks. Well liked throughout the whole Regiment and Corps, he will be sorely missed by everyone who knew him. Royal Engineers like George are a special type of person who are hard to find.

His Troop Commander, Lt David Thornett said:

> Lance Corporal George Partridge was a gift to me as a Troop Commander. He had everything that I could have expected of a Junior Non Commissioned Officer. He could always be relied upon to carry out a task to the best of his ability and to get the best out the individuals who were working for him. Having already been selected to promote to Corporal, I have no doubt he would have climbed through the ranks with ease and had a very successful Army career. On top of this he was genuinely a good bloke who knew how to make people laugh, he will be sorely missed.

His Squadron Commander, Major Matt Walker said:

> Every member of the Squadron, regardless of rank, looked up to and respected Lance Corporal George Partridge – we all aspire to be as fit, humble and capable as he was. The loss of this epic Junior Non Commissioned Officer leaves a void in the Squadron that can’t be filled.

His Commanding Officer, Lieutenant Colonel Simon Doyle said:

> Quietly determined, hard-working and immensely popular, Lance Corporal George Partridge was an exemplary soldier. Humble but hugely capable, he was always ready to lend a helping hand where it was needed the most and at some point everyone in the Regiment has had cause to be grateful for his ability to find you a car when the vehicle park seemed empty. Our clearest memories of him will always be on the rugby pitch and in the gymnasium, where he was the epitome of a Royal Engineer Junior Non-Commissioned Officer, always pushing himself and his soldiers to the next level, and always with a smile on his face. He will be sorely missed, and our thoughts are with his wife and family at this sad time.