Life™
Science Centre

An out-of-this-world space engagement programme

“As Mayor, I’m determined to create opportunity where it is lacking, and it’s places like the Life Science Centre with its inspiring space engagement programme and outreach activities that I’m delighted to support. They can make a crucial difference to children’s future and help the next generation aim for the stars - and enjoy a rewarding and fulfilling future right here in our region.”

Kim McGuinness,
North East Mayor

Introduction from Life's Chief Executive

It's more than 50 years since humans last stood on the Moon and many young people who saw those images on their TV screens decided then and there to boldly go where no one has gone before.

Today the space industry offers more opportunities than ever before for people with a variety of skills and specialities.

The worldwide space economy is expected to be worth over £500 billion by 2030, with a commitment to creating 10,000 new jobs in the North East by then. Our region, which is home to leading researchers and businesses innovating and solving real-world challenges, is front and centre in the growth of the global space sector.

Part of the amazing James Webb Space Telescope was developed and engineered here, and we have one of Europe's largest International Dark Sky Parks in Northumberland.

The new North East Space Skills and Technology Centre (NESST), a collaboration between Northumbria University, the UK Space Agency and Lockheed Martin UK Space, is expected to inject more than £260m into the North East economy over the next 30 years. It will support the skills needs of the sector as it grows and diversifies into manufacturing alongside Research and Development, from supporting people to transfer into the space industry in the immediate future, to nurturing the next generation of workers currently in school.

If this exciting industry is to grow and flourish, we need to nurture the necessary skills and talent. Central to this challenge is raising awareness and understanding of the space sector, and the opportunities it affords.

At Life, we're proud to be a place where everyone can explore space, sometimes for the first time. We work with urban and rural schools, all shapes and sizes of family, and underserved communities, reaching many young people who never would have considered a job in the space sector as 'for them'. It's here that the spark can be ignited and the future engineers, technicians and everyone else needed to realise our space ambitions, are inspired.

From our hands-on space exhibits and Planetarium to our schools' workshops and adults' events, there is nowhere else in the region that encourages a range of audiences to engage with space in the way we do.

In this document, we give a flavour of our approach and our place in helping to advance the region's position as a hub for space business and innovation.

Linda

Linda Conlon MBE DL

> **"At Lockheed Martin we know how vital it is that we inspire the next generation about the future career opportunities that space can offer them. The role played by Life in showcasing to these young people the very real possibilities in the sector which are within their grasp is key to us building a robust industry in the UK. Life's programme of exciting activities such as its planetarium shows, replica ISS and Mission Control exhibits, coupled with their workshops, aligns perfectly with our own STEM activities which hopefully give youngsters a real understanding of the space sector and opens their eyes to how they can be part of it."**
>
> Ben Shaw, Head, Operations and Capture – Space, Lockheed Martin

Life's role in space

The North East's space sector is diverse and requires individuals from all backgrounds and with a variety of skills to grow to its full potential. For the necessary pipeline of talent to emerge, people need to know that the industry, and opportunities, exist.

Life plays an important role in shining a spotlight on the space sector, inspiring and enthusing children from an early age through innovative programming with pre-schoolers and by working with schools. Family programmes and adult events in the science centre build and maintain this interest while also supporting parents to encourage their children's ambitions.

Children's interests, subject choices and career ambitions are shaped by many influences, but the greatest impact comes from those closest to them, the activities they do together and the habits that form. Life is unique in the region for its scale of engagement with both schools and families to build and nurture this ecosystem of influence.

Schools

Life's schools' programme aims to help young people develop their knowledge and understanding of space and inspire them to consider future careers in this industry. Life works to raise aspirations and ambitions, particularly amongst those who may not have considered this sector as being for 'them' and showcase the breadth and diversity of jobs available.

Life's focus is on delivering exciting, relevant and interactive STEM (Science, Technology, Engineering and Maths) experiences that cannot easily be replicated in the classroom.

Visits

Space remains the most popular theme in Life's portfolio of curriculum-linked workshops for Key Stage 1 up to post-16. Life's fully equipped labs and digital Planetarium provide unique settings for workshop delivery.

The science centre offers an extra dimension to visits. In Space Zone, students work together to build a module of the International Space Station, land spacecraft on the Moon and test prototypes to remove space debris. Over 30,000 students visit Life each year for a varied programme of focused workshops and informal activities.

> **"When I was younger, I designed my own rockets. NASA wasn't putting 10-year old British kids into space, so if anyone was going to do it, I'd have to do it myself. Now that I look back, the rocket I designed wasn't brilliant, but there were people in serious companies who took me seriously when I wrote letters to them, and I've never forgotten that."**

Shaun Whitehead, founder, Scoutek Ltd in Saltburn

Shaun Whitehead is a creative engineer and artist. His company developed tiny satellites known as ThumbSats. Read full blog here.

Space for All

In May 2024, Life was awarded a £100K UK Space Agency "Space for All" grant to boost its innovative work with schools from urban deprived or rural areas through its Space Explorers programme, partly funded by the Edina Trust. Through this, Life acquired a new mobile planetarium – a high-tech inflatable dome that recreates the experience of the science centre's permanent Planetarium in any location. The funding supported enhanced engagement with over 1200 students from 60 schools, comprising:

- An outreach visit from the Life team with the mobile planetarium with a newly developed show Lunar Landers which features local role models like Frazer Christie, SAR Specialist at Airbus, based in Newcastle
- A funded visit to the science centre for the full space programme
- A space-themed classroom resource kit to keep
- Online "I'm a Scientist" sessions where students interact with working space scientists and engineer role models

This multi-layered approach has been shown to have a much greater long-term impact on students than single activities, and Life is continuing to offer it across the whole of the North East.

Additional funding of £44K from the Edina Trust in May 2025 enabled 30 more schools to participate in the programme. This funding also supports the development of online resources to further enhance the delivery of Space Explorers.

Widening participation

***Space Explorers* builds on over a decade of outreach to rural communities supported by the Edina Trust. This unique approach was developed over several years and has benefitted thousands of children across the region. Without the support of programmes like this, small schools in rural communities and the most deprived urban schools struggle to offer curriculum enrichment.**

Life also offers special days designed for home educated children and operates after-school science clubs in the science centre and around the region in schools, to increase young people's access to, and participation in, high quality science learning.

If you are interested in supporting Life, or volunteering as an online role model, please get in touch: info@life.org.uk

> **"The North East has a rich heritage in engineering excellence and is driving forward new advancements in space technology through major projects such as NESST, backed by our Space Clusters Infrastructure Fund. To meet our shared ambitions, it is vital we support the development of new skills, engage proactively with people across the country and build a strong pipeline of future talent to take up the job opportunities in this fast-growing sector.**
>
> **Our work with Life through the Space for All programme is an important part of this. It delivers hands-on experiences and educational activities to local communities, highlights the vital role that space plays today, and how it will shape our future."**

Professor Anu Ojha OBE, Director of Championing Space, UK Space Agency

Science centre hands-on experiences

Families visit the centre for a 'value-added' day out, where parents can support their children to have fun while learning. Children see their parents supporting their interest in science and parents get an insight into their children's skills and expertise that is rarely seen outside of the classroom. Freed from the pressures of curriculum and assessment, the science centre allows people to express their curiosity, discover new interests and nurture a passion for science.

Space Zone

In this hands-on exhibition, audiences can explore the impact space technology has on our everyday lives and how the future of space exploration is being shaped in the North East. It highlights local expertise and role models as well as the international nature of space research, exploration and exploitation. See video. It includes:

The Sphere

This stunning, largescale spherical projection screen is ideal for sharing a space-eye view of the Earth, other planets and the Moon. It is used to tell stories about satellite data, global patterns and environmental change.

International Space Station

This detailed mock-up of an ISS module recreates some of the science and habitation elements of the station. Featuring first-hand accounts from astronauts, covering everything from eating and sleeping, to exercising and toilet habits, visitors find out what it's like to live and work in space.

NASA Mission Control

The team based on the ground is critical to every space mission. In this simulation of NASA's Mission Control, visitors take the driving seat to design missions and spacecraft, help clean up space and land a spacecraft on the Moon.

Space and climate

Through interactive exhibits, Life illustrates how satellites help us to monitor and adapt to climate changes, from forecasting the weather to monitoring penguin populations. Visitors are participants rather than merely spectators.

> Everyone loves learning about how to be an astronaut, but there are 150 people behind every astronaut in mission control, and there are space artists, space vets, space chefs, space lawyers, and so on. Basically, if you have a hobby, you can make it a space job."

Dr Sheila Kanani MBE, author and space engagement specialist

Sheila was inspired by space early in life and combined that with a talent for education. Read full blog here.

Science centre hands-on experiences

Planetarium

Life is home to the biggest planetarium in the North. It uses Digistar 7 technology. The Planetarium has ultra-rich, high-resolution visuals and enhanced sound quality to provide a unique, fully immersive 360° experience.

Supported by the Science and Technology Facilities Council, Life was one of the first places in the UK to share HD images from NASA's James Webb Space Telescope with live audiences, making the most of the world's most advanced planetarium system.

The talented in-house team has a growing reputation for writing and producing a range of innovative shows for the Planetarium, engaging audiences of all ages with space and the universe.

The presenter-led *The Sky Tonight* shows explore Newcastle's night sky without clouds or light pollution, while the *Earth Defenders!* retro 1980s-style show, part-funded by the UK Space Agency, throws the spotlight on a team of superhero satellites defending Earth from a range of threats – from asteroids to climate change. One of the latest shows, *Life: The Greatest Story* explores the origins of life on Earth, from bacteria deep in the ocean, to the evolution of plants, fungi and animals before exploring the big question....does life exist on other planets?

The Planetarium gives younger audiences their first experience of space in an accessible way, with in-house produced shows such as *What Santa Sees*, which follows Santa and his reindeer as they use the stars to guide their way home, and *Little Bear*, about a bear cub finding animals in the stars.

The flexibility of the Digistar system means that it can be used for a much wider range of programmes than a traditional planetarium. Adult audiences have enjoyed *The Dark Side of the Moon*, which combines breath-taking views of the solar system and beyond, played out to Pink Floyd's iconic album, and *Queen Heaven*, which combines classic music videos of the band with immersive solar system visuals and archive footage. Photographer, astronomer and aurora chaser Wil Cheung presented *Chasing the Aurora* in Life's planetarium, sharing insights on where, when and how to see the northern lights, using the state-of-the-art projection system to share his own footage of the aurora.

Life works with university researchers, musicians and poets to create experimental programmes, and is open to other creative uses of this amazing facility.

> **"Life's Planetarium is amazing. Being able to see the wonder of our universe up-close like this will hopefully go a long way in helping to inspire the next generation of astronauts!"**
>
> **Chris Hadfield, astronaut who served as commander of the International Space Station**

Meeting role models

Astronomers, engineers, physicists, tech experts, and even astronauts have shared their stories with Life audiences through exhibits, interactive sessions, workshops and science centre visits. Life's theatre and planetarium shows, busking trolleys and other live activities regularly feature local research, spotlighting the interesting and important work happening on our visitors' doorsteps. Life introduces their visitors to the wealth of career opportunities in the space industry, including unexpected options like law or gynaecology, and introduce them to real life role models.

Our *Spotlight On...* series gives audiences the opportunity to meet and chat to people working in the sector. In the *Spotlight On... Satellites day*, experts from regional universities, local space organisations and international businesses in the space sector like Airbus Defence and Space UK, based in Gosforth, highlight the North East satellite industry through hands-on activities.

Space fact

The global space industry currently provides jobs for around 400,000 people and is forecast to grow to over 1.5 million.

"It is vital we support the development of new skills and nurture future talent to take up the job opportunities in the fast-growing space sector. Life plays an important role by delivering hands-on experiences and educational activities to local communities, igniting ambition in the young people who will be part of this success story."

Olivia Masters, Head, Programmes Delivery, Geospatial UK, Airbus

"Visitors to the Space Zone at Life Science Centre have a truly wonderful resource to learn about the science of life, that will help to create a brighter future for everyone and enable us all to really enjoy being part of this vast and beautiful Universe."

Helen Sharman *(left)*, Britain's first astronaut, pictured with Life Chief Executive Linda Conlon

Science centre hands-on experiences

Gaia

Gaia is a glowing seven-metre-diameter recreation of Earth created by UK artist Luke Jerram. Using detailed NASA imagery of the Earth's surface to create a scale model of our planet, where 1cm on Gaia is equal to 18km on earth. It was designed to give viewers a sense of the Overview Effect experienced by astronauts. Common responses are feelings of awe for the planet, a profound understanding of the interconnection of all life, and a renewed sense of responsibility for taking care of the environment. See more.

Space fact

Under 30% of people currently working in the UK space industry are female, so better representation will be key to growth.

Making Studios and Experiment Zone

At its core, science and technology is about developing the mindset to tackle new challenges and solve problems.

In Life's Making Studios, problems are supplied in the form of design challenges like building and testing Moon rover vehicles. In Experiment Zone, guests work through experiments from start to finish, for example using chemicals to launch a mini rocket.

In all these activities, the important element is learning how to fail constructively, and build the resilience and skills required for work and everyday life.

Our World from Space

Life was part of a UK-wide programme uniting 22 UK science centres and museums to collectively engage audiences in the relevance of space science for the future health and sustainability of the planet.

The two-year national STEM programme, funded by the UK Space Agency enabled schoolchildren, families and community groups to take part in workshops and *Spotlight On...* events, and enjoy Planetarium shows and pop-up science demonstrations.

Special events

Science Speakeasy

This popular series for adults gives a platform for important and often controversial topics which are debated in a quirky and informal way. At the *Who Owns Space?* event, *(pictured right)* experts delved into the problem of space junk and the impact of the actions of billionaires and businesses involved with space.

Time Square rocket

The UK Space Agency docked its 72 ft model rocket *(pictured left)* in Times Square, outside the science centre, as part of its Space for Everyone tour. The event showcased the vibrant North East space sector and the exciting career opportunities available.

Record numbers of people continued their out-of-this-world experience inside the science centre, leading to an almost 200% rise in visitors, compared to the same period in the previous year.

"If you have a passion for space, you never lose it. It brings out a great deep-seated joy and interest in the world and the Universe you live in."

Dr David Rosario, Senior Lecturer in Astrophysics at Newcastle University, and panellist at Life's *Who Owns Space?* Speakeasy event. Read full blog here and see a video.

"It took thousands of people to make my mission to the International Space Station possible and there is a huge variety of careers on offer in space right here in the UK. I hope this activity [at Life] sparks an interest in the future generations who will take our space sector to new heights."

Tim Peake, British astronaut

Working together

The Life team has expertise in engagement and learning, and relies on the generous help and advice of experts in academia and industry to ensure that Life's exhibitions, shows and programmes best reflect the growing and changing space industry. Space Zone was created in partnership with a range of people who research and explore space, from tech experts to educators, engineers and builders. Life features real role models to show that 'ordinary people' can work in extraordinary jobs, which are increasingly available on our doorstep!

"It may be rocket science but it's not just for rocket scientists! Accessible to all, there are space careers across the North East region that cover many aspects from stargazing to satellite communications, space surveillance and tracking to policy, law and regulation."

Ralph "Dinz" Dinsley, space surveillance expert, and panellist at Life's *Who Owns Space?* Speakeasy event

Space fact

The average UK space sector salary is £49k, and in private industry 10% earn over £100k. Electronic engineers and computer scientists tend to earn more than physicists and aerospace engineers.

"My favourite thing about my job is working with young students and seeing the enthusiasm and passion they have."

Khurram Hussain, Operations Manager, AmbaSat

Northallerton-based AmbaSat create space satellite kits and educational courses.

After working in law and banking for several years, Khurram completed a two-year engineering diploma, hoping to build something that would go into orbit. While volunteering at a school, he met the CEO of AmbaSat, who offered him a role in the start-up company. Khurram has since worked with Life on several projects.

"Parents may not be aware that there's a world of possibilities out there for their children, and some of it's right here. There will be families living in Sedgefield who don't know that people near them are building stuff for the biggest telescopes on the planet."

Dr Peter Edwards, cosmologist and Director of Science Outreach, Durham University

Dr Edwards is from a mining family, and credits his successful career to his dad supporting his passion and his education. As part of his outreach work, Dr Edwards visits schools to build children's fascination with space. Read full blog here.

The North East: A place for space innovation

While many people think of crewed missions and rockets as the space industry, this is only a small part of the sector.

The vast majority of future jobs are forecast to be focused on satellites, from designing them to, using the data they generate to help tackle future space jobs global challenges. By 2030, an estimated 100,000 satellites could be operational.

The North East is home to companies and researchers that are playing a vital role in the space sector. There are already over 70 space organisations in the North East, employing more than 1300 people, with rapid growth expected over the next decade.

Here is a snapshot of the diverse range of activities happening on our doorstep, from public and private sector organisations large and small:

Space North East England (SNEE)

SNEE is an agency that supports and builds links between business, academia and institutions to unlock opportunities in the space sector for the region. Based at NETPark in Sedgefield, it works with partners to create facilities for new startup companies, runs events and networks to build connections, and supports the development of skills for the future space workforce.

Centre for Advanced Instrumentation (CfAI)

Based in Durham University, and at NETPark in Sedgefield, the CfAI develops new instruments for astronomy and space science.

The centre built one of the key instruments for the James Webb Space Telescope – which sits one million miles away from Earth, looking into the oldest parts of space, and is revolutionising our understanding of the universe.

North East Space Skills and Technology (NESST)

A state-of-the-art facility in Newcastle that is being developed by Northumbria University, NESST is the result of a £50m investment with partners including the UK Space Agency and Lockheed Martin UK Space. Due to open in 2026, the centre will house world-leading space experts and unite industry with academia to carry out cutting-edge research and the development of a range of projects, including space-based solar power. Skills training will also be provided to meet the demand for new jobs in the space sector across the region.

> **"It's our ambition to grow the North East space sector and that means more jobs in the region. It's vital, therefore, to encourage and nurture interest in space science from an early age. Life's fantastic engagement programme does just that. It offers a state-of-the-art Planetarium, a range of schools' workshops and opportunities for pupils to interact with role models. It's a wonderful resource and I'm proud it's in the region."**
>
> John Bone, Chair, North East Space Leadership Group

The North East: A place for space innovation

Northumbria University

Northumbria University has expanded its space research, building on its expertise in solar physics to expand to satellite communication, earth observation, space law and space physiology. The latter has seen the development of training and rehabilitation for astronauts on the International Space Station and future long duration missions to the Moon and Mars.

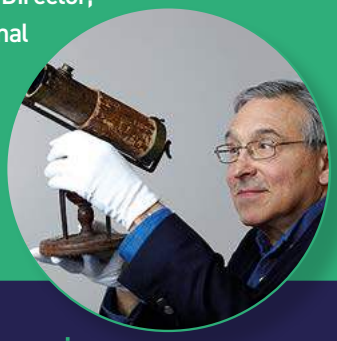
> "I love that even though space is really big, it joins people together—from physiotherapists to physicists and everyone in between."

Dr Kirsty Lindsay, Assistant Professor in Rehabilitation Science, Northumbria University, researching Human Health in Space and Post-flight Rehabilitation

Starting out in the Royal Air Force at 17, she then studied Physiotherapy. After a stint at the NHS, Kirsty did a master's degree in Space Physiology and Health. After two years working at the European Space Agency, Kirsty started her PhD at Northumbria University and brought her first exercise research experiment to Life.

> "We build instruments for some of the largest telescopes in the world. We observe amazing things, and we're particularly strong on computational cosmology theory."

Professor Carlos Frenk, Director, Institute for Computational Cosmology, Durham University and one of the world's leading cosmologists.
Read full blog here.



Durham University

Durham University has one of the top centres for astronomy research in the UK, carrying out work in observational astronomy, theoretical astronomy and instrumentation. Unique facilities include the Institute for Computational Cosmology, where simulations of the early universe are created in a supercomputer to test theories to explain how the Big Bang led to the universe we live in.

The new Space Research Centre will be an internationally recognised hub of excellence in space research, exploring cutting-edge technologies and the holistic understanding of space and its broader societal, ethical, and environmental impacts.

Space fact

Our region hosted the UK's first rocket engine test site from 1957, at RAF Spadeadam on the Cumbria/Northumberland border. The site is now used for electronic warfare training and saw the UK's first military drone swarm trials in 2021.

The North East: A place for space innovation

Newcastle University

Newcastle University has a wealth of research in space exploration, applications and technologies. These range from theoretical research in cosmology and quantum gravity, and astronomers using the James Webb Space Telescope, to engineers, geographers and archaeologists making use of satellites to measure, map and interpret the surface of the Earth. Newcastle is also a lead partner with Northumbria University in NU Data, the new Centre for Doctoral Training in data-intensive science that will train a new generation of data scientists working across the space sector.

> "It is amazing working in astronomy research. I love the new discoveries we make."

Chris Harrison, Astrophysics Researcher, Newcastle University

Chris works with Life to make Planetarium shows more accessible by representing objects and concepts in space with sound.

After secondary school, Chris studied Physics in Edinburgh followed by a PhD in Durham. He spent three years working at the European Southern Observatory near Munich, researching galaxies and black holes as well as working in the planetarium.

Space fact

The UK space industry comprises around 1,300 organisations, from small start-ups to multinational conglomerates.

Space fact

Lockheed Martin, partners with Northumbria University in NESST, has been operating in the UK for over 70 years.

Let's work together to make the North East a space powerhouse!

If our region's space industry is to grow in line with its ambitions, it needs an enthusiastic pool of future workers being nurtured through school and beyond. Today's reception classes will be the graduate recruits of the 2040s. The workforce of the 2030s is already in secondary school, and their parents are anxious about their children's future.

Life's quarter century of science engagement puts us in a prime position to help develop young people's interests and aspirations. We know that it's never too early to ignite a passion for science, hence our programmes for toddlers all the way up to the adult Speakeasy series.

We want to help create a better future for our region's children and young people, but we need the help and support of the space industry to provide the stories, resources and inspiration to underpin engagement.

Interested in working with Life?
Please get in touch: info@life.org.uk

Life™

SCIENCE FOR ALL

Life Science Centre, International Centre for Life, Times Square, Newcastle upon Tyne NE1 4EP

Telephone: 0191 243 8210 Email: info@life.org.uk Website: life.org.uk