

Your future in.... Space industry

Introduction

Our daily lives are influenced by what happens in space, much more so than we realise. The research from the space industry cascades down, affecting a wide range of technologies. It is estimated that up to 100,000 skilled jobs in the space sector will be created in the next 15 years. With such a positive outlook the opportunities for graduates look set to rise.

While the great majority of roles are in science and technology, there are also opportunities in areas such as law, policy, insurance, education, manufacturing and tourism.

The industry is essentially split in two: **upstream** and **downstream**. Upstream work is focused on sending objects into space and space exploration, while downstream utilises the research and technology from upstream in a range of different applications.

“The space sector is growing rapidly and society is increasingly dependent on it; the possibilities for STEM graduates are limitless and it's a fantastic feeling to work in an area on the edge of human exploration.” Dr Ashley Cooke, Galileo Programme Manager, UK Space Agency

Downstream is where greatest growth in the sector comes from and where the greatest number of opportunities are. **The industry needs people who can translate upstream research into downstream applications.**

Work experience and skills development

- The Young Graduate Trainees (YGT) programme at the European Space Agency (ESA) is a year-long placement for Masters graduates, advertised in November. About 80 posts are available, both technical and non-technical. Current Master's students can also apply for ESA's student placements, lasting 3-6 months.
- SpIN, the Space Placements in Industry scheme, part of the Satellite Applications Catapult at Harwell, offers internships with SMEs across the UK. <https://sa.catapult.org.uk/people/space-placements-industry-spin/>
- Keep up to date with organisations such as ESA, UK Space Agency and NASA on social media so you can demonstrate an interest in and understanding of the space industry.
- Networking is a way to find out more about the industry and the types of opportunities on offer as well as finding out about vacancies.
 - Join university branches of organisations such as UK Students for the Exploration and Development of Space (UKSEDS). Start your own if they don't exist!
 - Can your academic staff put you in touch with any industry insiders?
 - Meet industry representatives at events such as Farnborough Airshow.
 - Use social media to connect with people working in the industry
- Can you demonstrate an ability to innovate? Innovation is key to this rapidly changing sector. Look out for industry competitions, which tend to be technical and involve a problem that needs to be solved in a novel way.
- Speaking additional languages can be helpful in this international industry.





Postgraduate study and professional qualifications

The workforce of the space economy is very highly skilled. A postgraduate qualification is likely to make you more successful, and in some cases is a requirement.

When researching courses check what opportunities they provide for networking within the industry. Staying in academia puts you at the cutting edge of research and a lot of work in universities feeds into the work of commercial companies, so this is a great opportunity to build contacts.

“Study hard. Get an advanced degree in a field you enjoy working in. Persevere.”

Richard Mastracchio, retired NASA astronaut

The International Space University (ISU), based in Strasbourg, specialises in providing postgraduate education to those wanting to enter the global space community. The UK Space Agency funds a competitive scholarship scheme to support UK citizens who wish to attend the ISU nine week Space Studies Program and one year MSS Program.

A directory of education opportunities in space law has been produced by the United Nations Office for Outer Space Affairs: <http://tinyurl.com/UNOOSAeducationdirectory>

Job hunting: employers and graduate jobs

Employers

The space industry includes large multinationals and small and medium-sized enterprises (SMEs). The SMEs are particularly strong in leading innovation and driving space technology. Most UK space turnover is generated in the South-East.

Examples of UK global leaders in **space manufacturing**: Airbus Defence and Space UK; Surrey Satellite Technology Limited (SSTL); QinetiQ Group; Qioptiq Space Technology Ltd

Selected UK global leaders in **space operations**: Inmarsat plc; Arqiva; Commercial Space Technologies (CST); SIS Live

Selected UK global leaders in **ancillary services**: Atrium Space Insurance Consortium (ASIC); Spirent Communications plc; Sapienza Consulting

Government **space agencies** include: China National Space Administration (CNSA); European Space Agency (ESA); Indian Space Research Organisation (ISRO); Japan Aerospace Exploration Agency (JAXA); National Aeronautics and Space Administration (NASA); and Russian Federal Space Agency (RFSA or Roscosmos). Nationality requirements often apply for work at space agencies.

Graduate jobs

Technical

- Engineers –structural engineers, software engineers, systems engineers, electrical engineers and propulsion engineers. Postgraduate qualifications sometimes required.
- Planetary Scientists study planets and asteroids., Job titles include Geologist, Geochemist, Volcanologist, Seismologist, Hydrologist,





Geomorphologist, Atmospheric Scientist and Geoscientist. Relevant lab and fieldwork experience is advised.

- Astrobiologists study life in space. This multidisciplinary field requires subjects like astronomy, astrochemistry, astrobiology, biology and chemistry of life.
- Astrophysicists study objects in space, using telescopes, probes and sensors to collect and analyse data. Job titles include Astronomer, Research Scientist, Physicist, Space Physicist and Spectroscopist. A physics degree, with a focus on astrophysics, is normally required; doctorates are common.
- Astronauts – your chance of becoming an astronaut is small. In the past successful candidates have had previous experience in, for example, military aviation, deep sea diving, engineering and a range of scientific disciplines.

Non-technical

Besides the non-technical roles common to many industries (sales, PR, business strategy, project management.) there are roles in areas more specific to the space sector. These include:

- Space education –Science/space centres, observatories and museums usually employ outreach and education staff.
- Space journalism –The Association of British Science Writers is a good starting point for aspiring space journalists.
- Space law –identify firms who may specialise in this field of law by using law directories, such as the Legal 500 or Chambers, and searching under aviation law.
- Space insurance – this is a very niche area of the insurance business in the UK. Lloyds of London, Atrium and XL Catlin are specialist insurers operating in this field.

“Space in Scotland offers a broad range of career possibilities – from engineers to marketers – just bring your imagination.” Callum Norrie, Network Integrator, Space Network Scotland

Advertised vacancies

Some larger companies in the space sector offer graduate schemes, including:

- Airbus Defence and Space
- Defence Science and Technology Laboratory (DSTL)
- The Science and Technology Facilities Council
- Surrey Satellite Technology Ltd(SSTL)
- Telespazio VEGA
- Avanti Communications
- BAE Systems
- CGI
- Thales UK
- Qinet

UKSEDS lists graduate vacancies and internships: <http://ukseds.org>

Use specialist jobs websites such as Space Careers, New Scientist Jobs, Royal Aeronautical Society Jobs Board and The Engineer to find vacancies in this sector.





Unadvertised vacancies

Speculative applications may be necessary for smaller companies. More advice on making speculative applications is available here: www.ed.ac.uk/careers/spec-apps

To help you identify smaller companies use the following resources:

- The ESA SME database lists companies throughout the world <http://smed.esa.int>
- UKSpace lists member organisations: www.ukspace.org/membership/members
- UKSpace SME Forum lists small and medium members operating in the UK space sector: www.ukspace.org/spaceorganisations/smeforum
- London Institute of Space Policy and Law provide a directory of organisations involved in the space community: www.space-institute.org/resources
- Farnborough International Airshow website has an exhibitors list detailing aerospace companies attending their trade show: www.farnborough.com/trade

Find out more

Visit the 'Occupations' section of our website to find links to all the essential sites, including detailed job profiles and professional associations:

www.ed.ac.uk/careers/engineer/specialisms

www.ed.ac.uk/careers/research-development

