Skills demand for early career space jobs

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Space Skills Alliance

Space Skills Alliance

The Space Skills Alliance is the think-tank and backbone organisation addressing the skills shortage in the space sector. We work to ensure that the growth of the UK space sector is not constrained by a lack of access to talent.

We:

- Collect and publish data and analysis on the state of the sector's skills pipeline to identify issues in current approaches and policy, and inform decision making across the sector.
- Promote and advise on best practice in recruitment, retention, and training, and provide a consultancy service to our members.
- Bring together organisations and stakeholders from across the sector to network and learn from each other at events and through specialist working groups.

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Photos
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SKILLS DEMAND FOR EARLY CAREER SPACE JOBS IN THE UK

Introduction & Summary

The UK's space sector is growing at a rate of more than 3% per annum, creating hundreds of new jobs each year[1a,] and has set the goal that it should have a global market share of 10% by 2030[2].

However, UK space companies are facing a skills shortage. 68% predict that they will be hiring over the next 3 years, but already more than half of large organisations report being worried about having access to skilled workers, and nearly 40% of all organisations say staff recruitment is a major barrier to their growth[1c].

Though there is a lot of anecdotal evidence of skills shortages in particular areas[3], there is very little detailed data available for the sector on the relative demand for different skills. Understanding exactly which competencies the sector is lacking is vital in informing provision of training and approaches to recruitment

To address this, we have developed a taxonomy of space sector skills[4] and used this to give the first quantitative assessment of skills demand in the sector.

- This is the **first quantitative assessment of skills demand in the UK space sector.**
- We analysed **812 early career UK space sector job adverts** using our previously developed competencies taxonomy to identify competencies in highest demand within the UK space sector.
- The **most sought after technical skill is software development** (required by 49% of all jobs), particularly in C/C++ (22%) and Python (20%).
- This suggests the space skills shortage is largely a tech skills shortage, and shows that **programming skills must be a strategic priority for the sector's skills strategy.**
- There is also a **high demand for transferable skills** including interpersonal (84%) and communication (76%) skills.
- This further demonstrates the importance of these skills, and that **the sector must ensure that they are taught and developed alongside technical ones**.

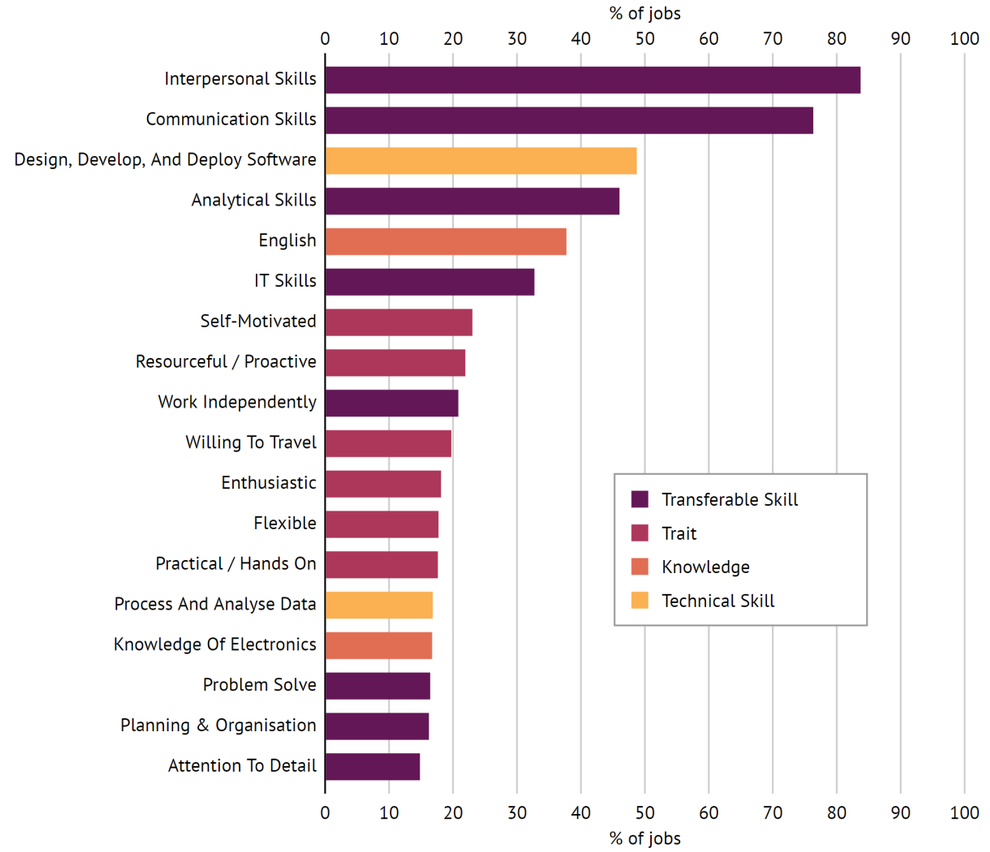


Figure 1: Top competencies (appearing in at least 10% of jobs)

1. UK Space Agency (2018), *Size & Health of the UK Space Industry 2018*, a: pp16-17, b: pp17-18, c: p19, d: p22
2. Space IGS (2010), *A UK Space Innovation and Growth Strategy 2010 to 2030*, p10
3. Space IGS (2014), *Space Innovation and Growth Strategy 2014 – 2030: Skills Theme Report*, a: p4
4. Space Skills Alliance (2020), *Towards a competencies taxonomy for the space sector*

Competency demand by job area

Competency	All Jobs	Engineering	Computing & Data Analysis	Science Research	Business	Administration	Policy	Education & Outreach	Other
	n = 812	*n = 339*	*n = 207*	*n = 44*	*n = 83*	*n = 65*	*n = 18*	*n = 32*	*n = 7*
Interpersonal skills	84	81	82	89	89	91	72	91	71
Communication skills	76	76	65	82	93	85	89	88	86
Design, develop, and deploy software	49	49	86	43	11	15	11	9	0
Analytical skills	46	54	46	55	36	28	72	6	14
English	38	33	35	45	55	45	67	13	43
IT skills	33	24	44	9	31	65	44	34	29
Self-motivated	23	23	22	25	30	26	6	13	0
Resourceful / proactive	22	22	19	18	34	22	28	19	29
Work independently	21	18	19	16	28	26	39	28	0
Willing to travel	20	15	23	16	19	34	17	22	14
Enthusiastic	18	15	16	23	19	20	0	53	14
Flexible	18	15	15	16	17	34	28	25	14
Practical / hands on	17	27	13	18	6	8	6	13	0
Process and analyse data	17	15	33	18	2	8	6	0	0
Knowledge of electronics	17	32	9	2	2	9	0	0	0
Problem solve	16	21	16	7	13	17	6	3	0
Planning & organisation	16	12	8	25	27	26	28	34	29
Attention to detail	15	16	11	7	13	29	6	13	14

Table 1: Percentage demand for top competencies (those appearing in at least 10% of jobs) split by job area. The Engineering and Computing & Data Analysis areas are further broken down on the following page.

Technical skills & knowledge

The most significant result in this analysis is the very high demand for software development and data analysis skills (49%), which are by far the most sought after technical skills. For comparison, the next highest technical competency is knowledge of electronics at just 17%.

49% of jobs require programming skills

Specifically, demand appears to be highest for expertise in C and C++ (22%), Python (20%), MATLAB (12%), and Java (11%). It should be noted that many adverts list multiple programming languages and state that experience with any is acceptable.

Transferable skills

There is a very high demand for transferable skills ranging from 'softer' interpersonal and communication skills (84%), to 'harder' analytical and problem solving skills (46%). It is possible that true demand is higher still, as a requirement for certain transferable skills is often implied rather than specifically mentioned, though findings by the Skills Builder Partnership in analysis of job adverts across all sectors[5] suggest that this adverts for early career roles tend to be more explicit. A handful of job adverts make no mention of any transferable skills, focusing solely on technical ones.

Breaking down the demand for transferable skills by job area shows the unsurprising results that engineering roles require a practical or hands-on attitude (27% vs 17% for all jobs), and outreach roles require enthusiasm (53% vs 18%). Resourcefulness and proactivity are demanded more for business (34% vs 22%) and policy (28%) roles.

Traits

A large number of the most demanded competencies are traits. This is significant because these characteristics are more difficult to formally teach, and are typically cultivated over a long period from a very early age (such as creativity and self-motivation), or form part of a person's personality or personal preferences (such as enthusiasm and willingness to travel). They are likely to be beyond the scope of the space sector's immediate skills pipeline, but the sector should support efforts to develop character throughout formal and informal education.

5. Skills Builder Partnership (2019), *Towards a Universal Framework for Essential Skills*, p52

Competency demand by job area

Engineering and Computing & Data Analysis subareas

		Engineering					Computing & Data Analysis		
Competency	**All Jobs**	**Mechanical, Thermal, and Propulsion**	**Electrical & Electronic Engineering**	**Systems & AIT**	**Mission Operations**	**Technician**	**Software Engineering**	**Data Analysis**	**Remote Sensing**
	n = 812	*n = 53*	*n = 133*	*n = 57*	*n = 51*	*n = 12*	*n = 132*	*n = 21*	*n = 50*
Interpersonal skills	84	89	82	91	76	75	84	86	76
Communication skills	76	81	72	70	86	75	66	62	64
Design, develop, and deploy software	49	40	50	51	71	17	95	71	70
Analytical skills	46	74	51	54	59	8	36	67	66
English	38	36	32	16	51	25	41	19	26
IT skills	33	30	22	21	31	50	53	14	36
Self-motivated	23	28	17	26	27	8	27	10	14
Resourceful / proactive	22	25	22	25	20	17	23	10	14
Work independently	21	19	17	18	29	17	19	14	22
Willing to travel	20	17	15	21	12	0	24	24	16
Enthusiastic	18	15	14	12	14	8	17	0	12
Flexible	18	13	12	18	20	17	15	5	18
Practical / hands on	17	40	25	32	12	17	10	14	14
Process and analyse data	17	2	21	21	14	0	23	33	62
Knowledge of electronics	17	13	51	26	14	25	11	5	0
Problem solve	16	28	21	25	8	42	17	0	18
Planning & organisation	16	15	8	14	10	50	8	10	8
Attention to detail	15	17	19	16	10	50	11	10	12

Table 2: Percentage demand for top competencies (those appearing in at least 10% of jobs) split by job Engineering and Computing & Data Analysis subareas.

Software skills

Unsurprisingly, this demand is highest in software engineering roles (95% vs 49% for all jobs), but these skills are in high demand across all segments and sizes of employers, and particularly in downstream companies (60%). This is significant because the downstream space sector – space applications and data companies – employs the vast majority (79%) of space sector workers and has grown at an average rate of 5% per annum in the last five years[1b], so the demand for these skills will only increase.

60% of downstream companies want programmers

This aligns with the results of the EO4GEO Space/Geospatial Sector Skills Strategy which found "the results of the job advertisements analysis confirmed the importance of recognizing 'Programming and development' as a key EO/GI skill sets, alongside other skills sets such as 'Analytical Methods"[6].

Similarly, in remote sensing roles data analysis (62% vs 17% for all jobs) and GIS skills (71% vs 9%) are most in demand, CAD skills are wanted for mechanical, thermal, and propulsion engineering (52% vs 8%) and electronics skills are most in demand in electronic engineering roles (51% vs 19% for all jobs). These variations are also reflected in the analysis by company segment, with upstream companies demanding electronics and CAD skills, and downstream ones demanding data analysis and GIS skills.

Transferable skills

There is also a large degree of variation between job areas for analytical skills, ranking highest in mechanical, thermal, and propulsion engineering (74%), policy (72%), data analysis (67%), and remote sensing (66%), and lowest in outreach (6%), and technician roles (8%).

Adverts for technician roles ask for certain transferable skills such as attention to detail (50% vs 15% for all jobs) and organisation (50% vs 16%) much more often. This may accurately reflect higher demand for these skills in technician roles, but it may also be a result of distortions from a very small sample size of just 12.

The majority of transferable skills see very similar demand in both segments. A practical or hands-on attitude is in higher demand for upstream companies (22% vs 13% for downstream jobs) which is explained by the differences in typical job roles. Interestingly, upstream demand is also notably higher for people who are resourceful (28% vs 14%) and self-motivated (24% vs 17%), whilst downstream demand is higher for people who are flexible (23% vs 13% for upstream jobs). It's not clear why these transferable skills show this variation, as at first glance they appear to be independent of the business area.

6. EO4GEO Consortium (2019), *Space/Geospatial Sector Skills Strategy*, p57

Competency demand by employer

Competency	All Jobs	Segment				Business Size			
		Upstream	Downstream	Ancillary	Academia	Micro	Small	Medium	Large
	n = 812	*n = 279*	*n = 184*	*n = 331*	*n = 18*	*n = 35*	*n = 94*	*n = 207*	*n = 281*
Interpersonal skills	84	82	83	86	72	86	82	90	79
Communication skills	76	76	66	82	72	54	71	67	83
Design, develop, and deploy software	49	52	60	41	22	54	49	48	61
Analytical skills	46	48	49	43	33	34	43	42	56
English	38	37	34	41	17	31	36	35	38
IT skills	33	28	35	36	22	23	44	37	32
Self-motivated	23	24	17	25	22	14	28	32	20
Resourceful / proactive	22	28	14	20	33	6	28	24	21
Work independently	21	17	20	24	33	9	24	21	16
Willing to travel	20	16	22	20	39	14	28	14	23
Enthusiastic	18	15	13	23	17	20	14	17	21
Flexible	18	13	23	19	11	17	27	17	15
Practical / hands on	17	22	13	16	28	20	31	17	16
Process and analyse data	17	13	25	15	11	17	18	15	21
Knowledge of electronics	17	28	8	12	17	23	20	28	13
Problem solve	16	15	11	20	17	17	19	14	17
Planning & organisation	16	10	11	24	22	14	20	14	12
Attention to detail	15	16	10	16	11	3	16	19	15

Table 3: Percentage demand for top competencies (those appearing in at least 10% of jobs) split by employer segment and size.

Future work

Building on this report

There are a number of avenues for further research building on this analysis.

We intend to run similar analysis on other datasets that cover jobs outside of early careers to get an indication of if and how demand varies between different career levels.

We want to look more closely at demand for programming skills, particularly which languages are in most demand and why, and what work has already been done to attract people with these skills into the space sector and to upskill those already in the sector.

We also want to better understand how the demand we have identified compares to skills shortages within the sector. How many of the vacancies we have examined are being filled, and do those people who are recruited have all the skills that are being asked for?

Wider research

This report is the first step in our goal of building an evidence base to inform the development of a robust skills pipeline for the space sector. Our research areas include:

The space skills gap

Where are the skills shortages in the space sector?

Best practice

What is the best practice in recruitment, training, and inclusion within the space sector, and what can we learn from other sectors?

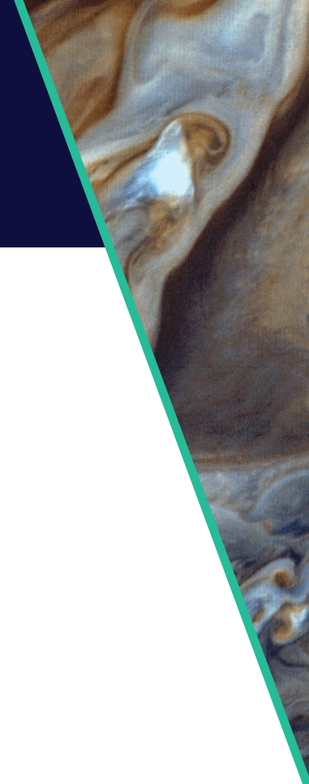
The future space workforce

What does the future space workforce look like, and how can we attract them to the sector?

Perceptions of the space sector

What do people think of the space sector, and is it a sector they want to join?

What does this mean for the space sector?



An important point to note before examining the implications of these results on the space sector is that this data only tells us the *demand* for competencies and not where there are *shortages*. More work is needed before we can get a clearer picture of the sector's skills shortages.

The space skills shortage is largely a tech skills shortage

The size of demand for programming skills over all other technical skills strongly suggests that the space skills shortage is largely a subset of the UK's larger tech skills shortage, which has already been extensively documented. The House of Commons Science and Technology Committee said in 2016 that 'the UK faces a digital skills crisis' and found that the digital skills gap is affecting 93% of UK tech companies[7], and in 2018 the Edge Foundation reported that there were more than 600,000 tech vacancies[8].

Looking at the space sector specifically, the 2014 Space IGS Skills Theme Report highlighted a 'lack of technical computing and programming skills in the workforce as a whole and recent graduates in particular', drawing on data from NERC, AIRTO, and others[3a]. The IGS report noted that:

> *In general [...] employers did not have difficulty filling positions since the pool of applicants is global. Where indigenous graduates might lack the modelling and mathematical analysis skills these skills can be sourced from overseas.*

This is especially noteworthy in the context of Brexit, which is expected to significantly increase barriers to hiring from overseas and significantly impact the aerospace industry's skills pipeline[9].

Programming skills must be a priority in the sector's skills strategy.

The very high demand for programming skills which we present has significant implications for the design of the space sector's recruitment pipeline from school outreach through to ongoing professional development training. **Programming skills must be a priority in the sector's skills strategy.**

Demand for these particular skills also puts the space sector in direct competition with the broader tech sector, which offers a higher profile (of the 20 most recognised brands in the world, 50% are tech companies[10]) and higher average pay[11].

If it is to properly compete, then **work must be done to address this imbalance and raise the profile of the space sector among tech professionals and graduates.**

The root causes of the skills shortage must also be addressed. The tech sector has already invested a great deal of resources into tackling this problem. The space sector must draw on the lessons learned from this work in the development of its own strategy both independent of and in partnership with the tech sector.

Transferable skills are vitally important

It is perhaps unsurprising that our analysis shows a very high demand for transferable skills; it is to be expected from their very definition. However this is useful further evidence of the importance of these skills and the impact that not having them can have on a technically skilled candidate's prospects.

The 2014 Space IGS Skills Theme Report highlighted a 'lack of understanding of the importance of professional communication'[3a], and research from the wider engineering and STEM sectors have reported that many employers feel graduates do not have these skills to the level that they expect. The 2016 Wakeham Review found that only 25% of employers felt that STEM graduates had the 'work ready' skills they needed[12], whilst the IET's 2019 Skills Survey found that 73% of companies had a problem with candidates who have academic knowledge but lack workplace skills[13]. This is considerably more than the 59% of companies that were concerned about a shortage of engineering or technical skills at a professional level.

These findings reinforce the importance of transferable skills, and the sector must ensure that they are taught and developed alongside technical ones.

7. House of Commons Science and Technology Committee (2016), *Digital skills crisis: Second Report of Session 2016–17*, p3
8. The Edge Foundation (2018), *Skills Shortages in the UK Economy: Edge Bulletin 2*, p12
9. House of Commons Business, Energy and Industrial Strategy Committee (2018), *The impact of Brexit on the aerospace sector: Sixth Report of Session 2017–19*, p17
10. Interbrand (2018), *Best Global Brands 2018 Rankings*
11. Office for National Statistics (2020), *EARN03: Average weekly earnings by industry*
12. Wakeham (2016), *Wakeham Review of STEM Degree Provision and Graduate Employability*, p41
13. IET (2019), *IET Skills and Demand in Industry: 2019 Survey*, p16

Methodology

Datasource

SpaceCareers.uk is a British space jobs board operated by UKSEDS, the UK's national student space society, which focuses on apprenticeships, internships, graduate schemes, PhDs, postdoctoral fellowships, and other early careers opportunities. The cutoff criterion is that positions require no more than three years of experience. We analysed job adverts posted on SpaceCareers.uk between December 2015 and December 2019.

The initial dataset contained just under 1300 adverts. We cleaned this dataset by removing duplicate adverts, and excluding all adverts which were not for internships, graduate positions, or direct entry jobs. This left us with 812 adverts (referred to as the SCUK dataset). The characteristics of the datasets and its limitations are discussed in the Appendix (page 14).

Competencies taxonomy

We analysed the dataset using our previously developed competencies taxonomy and library of natural language examples of competency descriptions. An overview of the taxonomy is provided here for context. The full taxonomy and a more detailed explanation of its structure can be found on our website.

The taxonomy has a hierarchical structure with up to five levels:

1. Competency type (trait, knowledge, technical skill, transferable skill, or qualification)
    a. Trait – features of a person's character or personality, embodied by behaviours
    b. Knowledge – facts or information about a given topic
    c. Technical skill – a skill which is specific to a sector or job
    d. Transferable skill – a skill which can be applied in a similar way to most jobs
    e. Qualification – a formal recognition of certain knowledge or skills following an assessment process by a relevant body
2. Thematic area (science & engineering, programming & computer science etc.)
3. Competency
4. Subcompetency (if necessary)
5. Subcompetency (if necessary)

Qualifications were not included in this analysis, but will be a topic of future work.

Analysis

A competency can be described in a job advert in a number of different ways. For example, the taxonomic entry of 'communication skills' might be described as 'communication and presentation skills' or 'written and verbal communication'.

We measured how often each specific competency was mentioned across the whole dataset, and additionally how many job adverts mentioned at least one competency in each category. In this way, we obtained a measure of the frequency with which particular competencies were mentioned.

Subcompetencies were grouped with their parent competency, so mentions of 'MATLAB' (3.2.3.11) and 'Python' (3.2.3.12) were counted towards 'Design, develop, and deploy software' (3.2.3).

Each item in the taxonomy has a specific code representing the hierarchical levels. For example, the code '3.2.1.1.1' represents the following:

```
3.2.1.1.1
3 - Technical skills
  2 - Programming & Computer Science
    1 - Process and analyse data
      1 - Geospatial data
        1 - GNSS data
```

Accuracy

We assessed the accuracy of our analysis by manually checking an additional randomly selected 50 job adverts and identifying any tags that had been missed or added incorrectly by the tagging algorithm.

Across the 50 jobs there were 468 tags in 383 categories. We found that 5 (1.3%) of these categories were incorrect – for example an advert for an administrative role described the employer as an 'electronics' company, and the job was incorrectly classified as requiring knowledge of electronics. We also found that there were 30 tags (6.4%) that we would have applied but had not been by the algorithm – for example we would have tagged 'autonomous and challenge-driven' as an example of the skill of working independently.

These errors were not corrected, as we aimed to strike a balance between the time needed to manually classify all the jobs and the error rate associated with doing so automatically, and we believe that this low error is an acceptable tradeoff. We hope to improve this error rate in future work.

Methodology (continued)

Job classification

We classified the jobs manually by specific functional area based on their job title using the keywords below and the text of the job description where necessary. We then grouped functional areas into the categories and subcategories shown below.

Jobs were only classified into one functional area. Jobs which spanned more than one area were classified into the most relevant area, but we recognise that this will not always be a perfect fit.

Job Area	Indicative Keywords
Engineering	
General engineering	Engineer (where not otherwise categorised below)
Electrical & Electronic engineering	Electrical, electronics, RF, microwave, PCB, antenna, spectrum, avionics, communications
Systems & AIT	Systems engineer, design engineer, quality, robotics, instrumentation
Mechanical, Thermal, and Propulsion	Mechanical, thermal, insulation, propulsion, CAD, materials, launch systems
Mission operations	Spacecraft control, satellite operations, control systems, ground systems, mission operations & planning
Technicians	Technician
Computing & Data Analysis	
Software engineering	Software, developer, UX, website, cyber
Data analysis	Data analyst, data scientist
Remote sensing	Remote sensing, GIS, GNSS, Earth observation
Science research	Scientist, researcher, astronomer
Business	Business analyst, business manager, business development, bid manager, PR & communications, marketing, sales
Administration	Administrator, assistant, receptionist, events, finance, HR, IT, project manager
Education & Outreach	Teacher, education & outreach officer, presenter, explainer,
Policy	Policy, law, regulation, contracts
Other	Journalism

Table 4: Job area categories and indicative keywords.

Employer classification

We classified business employers manually by size and by segment using the information provided on their websites and LinkedIn profiles. Non-business employers such as universities, non-profits, and outreach providers are not included in size breakdowns.

Size classifications

We used the OCED's definitions for business size for our classification[14].

Business Size	Number of Employees
Micro	1 - 9
Small	10 - 49
Medium	50 - 249
Large	250+

Table 5: Employer business area category definitions.

Segments classifications

We used segment definitions that are broadly the same as those used by the UK Space Agency[1].

Employers were only classified into one business area. Employers whose activities spanned more than one business area were classified into the most relevant area, but we recognise that this will not always be a perfect fit.

Business Area	Segment
Satellite/payload manufacturing	Upstream
Subsystem supplier	Upstream
Component/materials supplier	Upstream
Prime/system integrator	Upstream
Testing	Upstream
Launch vehicles and subsystems	Upstream
Launch services	Upstream
Ground segment equipment	Upstream
Software, IT, and other engineering services	Varied depending on company specialism
Ground segment operator	Downstream
Satellite operations	Downstream
Satellite service provision (broadcast, comms, navigation, EO, weather etc.)	Downstream
Sat data processing	Downstream
User equipment	Downstream
Satellite data user	Downstream
Research & development	Ancillary
Policy & regulation	Ancillary
Finance, insurance, and other support services	Ancillary
Education & outreach	Ancillary

Table 6: Employer business area categories and associated segments

14. OECD (2001), *Small and medium-sized enterprises*

Limitations

Analysis Limitations

Demand vs shortages

Our analysis gives an indication of the demand for certain competencies within the UK space sector, but without knowing the supply of workers with these competencies, we are not able to make conclusions about where the shortages are. This is an area for future research.

Adverts are a proxy

We assume that the competencies asked for in job adverts are the ones employers want, but this may not always be the case. Job adverts may be poorly written, or may treat certain skills (such as time management) as implicit and not necessary to specify.

Dataset Limitations

Early careers bias

The SCUK dataset is made up of adverts for early career space jobs. The competencies demanded for early career jobs may be different from the demand across the sector more generally. In future work we will look at wider datasets to examine this in more detail.

Upstream bias

The SCUK dataset is significantly biased toward upstream companies compared to data from the UK Space Agency's Size and Health report[1b].

Segment	SCUK Dataset (% of jobs)	S&H 2018 (% of jobs)
Downstream	35	81
Upstream	65	19

Table 7: Distribution of jobs by segment in the SCUK dataset and the Size and Health report.

As a result, where there is a significant variation between upstream and downstream demand for a competency (such as for data analysis skills), the 'all jobs' figure should not be considered an accurate picture of sector-wide demand, and instead demand should be looked at on a sector-specific basis.

Individual job bias

SpaceCareers.uk cautioned that some schemes with large numbers of openings – for example the ESA Young Graduate Trainee Programme – are represented by only a single advert per year.

Inclusion of non-UK jobs

Though we present our analysis as being an assessment of skills demand in the UK space sector, about 30% of the jobs in the SCUK dataset are based outside of the UK. Of these, most (28%) are based in Europe, primarily Germany (10%) and the Netherlands (4%).

SpaceCareers.uk advertised these roles as they were open to British nationals, and we include them as many relate to work in which the UK is closely involved, or to agencies such as ESA of which the UK is a member country.

There is no indication that the demands of the European space sector are significantly different from those of the UK's, and many of these roles may need to be duplicated in the UK after Brexit if the UK develops replacement for EU programmes such as Galileo[15].

UK regional bias

The SCUK dataset has a significant bias toward companies in the South East of England and Scotland at the expense of London, the South West, and the East of England compared to data from the UK Space Agency's Size and Health report[1d].

Region	SCUK Dataset (% of jobs)	S&H 2018 (% of employees)
Scotland	8.7	18.1
North East	0.2	2.2
North West	1.6	5.6
Yorkshire and the Humber	0.3	3.1
East Midlands	5.2	2.1
West Midlands	0.2	2.8
East of England	5.7	10.5
Wales	0.5	1.2
London	9.0	29.4
South East	53.9	21.6
South West	9.4	3.2
Northern Ireland	0	0.3
Other (includes jobs with no fixed location)	5.2	0

Table 8: Distribution of jobs in the SCUK dataset and employees in the Size and Health report by UK region.

It is not clear why this is the case, but as a result care should be taken when considering our findings in a regional context. We have chosen not to segment our results by region because the sample size for some regions is too small to be a useful indication of demand in those regions.

15. Department for Business, Energy & Industrial Strategy (2019), *Satellites and space programmes from 1 January 2021*

Dataset characteristics

Country breakdown

Country	Number of jobs (count)	Number of jobs (%)
Austria	9	1.1
Belgium	9	1.1
Bulgaria	1	0.1
Canada	2	0.2
Chile	1	0.1
Czech Republic	2	0.2
Denmark	3	0.4
Europe Wide	2	0.2
Finland	7	0.9
France	20	2.5
French Guiana	2	0.2
Germany	79	9.7
Ireland	1	0.1
Italy	15	1.8
Japan	9	1.1
Luxembourg	7	0.9
Norway	1	0.1
Poland	2	0.2
Portugal	1	0.1
Spain	13	1.6
Sweden	4	0.5
Switzerland	2	0.2
The Netherlands	36	4.4
UK	573	70.6
USA	9	1.1
Worldwide	2	0.2

Table 9: Distribution of jobs by country in the SCUK dataset.

UK region breakdown

Region	Number of jobs (count)	Number of jobs (%)
East Midlands	30	3.7
East of England	33	4.1
London	52	6.4
North East	1	0.1
North West	9	1.1
Scotland	50	6.2
South East	310	38.2
South West	54	6.7
Wales	3	0.4
West Midlands	1	0.1
Yorkshire and the Humber	2	0.2
Other	30	3.7
Non UK	237	29.2

Table 10: Distribution of jobs by UK region in the SCUK dataset.

Job type breakdown

Job Type	Number of jobs (count)	Number of jobs (%)
Apprenticeship	17	2.1
Direct Entry Job	410	50.5
Graduate Position	190	23.4
Internship	195	24

Table 11: Distribution of jobs by type in the SCUK dataset.

Business size breakdown

Size Classification	Number of jobs (count)	Number of jobs (%)
Micro	35	4
Small	94	12
Medium	207	25
Large	281	35
n/a	195	24

Table 12: Distribution of business employers' jobs by employer size in the SCUK dataset. Non-business employers (such as universities) are classified *n/a*.

Job category and functional area breakdown

Category	Functional Area	Number of jobs (count)	Number of jobs (%)
-	Mixed	16	2
Administration	Administration	14	1.7
	IT	6	0.7
	Events	7	0.9
	Finance	10	1.2
	HR	2	0.2
	Management	2	0.2
	Project management	21	2.6
	Recruitment	3	0.4
Business	Business Analyst	7	0.9
	Business Development	18	2.2
	Communication	27	3.3
	Marketing	17	2.1
	Sales	14	1.7
Computing & Data Analysis	Architecture	6	0.7
	Artificial Intelligence and Machine Learning	3	0.4
	Data Analysis	16	2
	Data science	5	0.6
	Geospatial	1	0.1
	Software Engineering	124	15.3
	Remote sensing	49	6
	Web Development	3	0.4
Education & Outreach	Outreach	32	3.9
Engineering	Assembly, Integration and Test	12	1.5
	Astrodynamics	16	2
	Technician	12	1.5
	Telecommunication	14	1.7
	Control	12	1.5
	Design	1	0.1
	Electrical	11	1.4
	Electronics	75	9.2
	Systems & AIT	34	4.2
	Materials	2	0.2
	Mechanical	34	4.2
	General engineering	33	4.1
	Mission Planning	5	0.6
	Propulsion	7	0.9
	Quality	6	0.7
Engineering	Systems	33	4.1
	Space systems	5	0.6
	Spacecraft Operator	18	2.2
	Structural	3	0.4
	Thermal	7	0.9

Table 13: Distribution of jobs by category and functional area in the SCUK dataset.

Job category & functional area breakdown (continued)

Category	Functional Area	Number of jobs (count)	Number of jobs (%)
Other	Education	3	0.4
	Journalism	4	0.5
Policy	Policy	18	2.2
Science research	Science research	41	5
	Earth Science	2	0.2
	Physiology	1	0.1

Employer segment and business area breakdown

Segment	Business Area	Number of jobs (count)	Number of jobs (%)
Ancillary	Non-profit	26	3.2
	Policy and regulation	5	0.6
	Space agency	48	5.9
	Other	55	6.8
	Research & development	50	6.2
	Consultancy	8	1
	Academia	92	11.3
	Marketing and communications	3	0.4
	Education & Outreach	22	2.7
	Market research and consulting	3	0.4
	Recruitment	21	2.6
Downstream	Downstream software and IT	1	0.1
	Satellite data user	1	0.1
Midstream	Ground segment equipment	5	0.6
	Satellite meteorological service provision	3	0.4
	Satellite operations	2	0.2
	Sat data processing	47	5.8
	Satellite communication service provision	24	3
	Satellite EO service provision	30	3.7
	Ground segment operator	22	2.7
	Midstream software and IT	29	3.6
	Midstream support services	27	3.3
	Satellite navigation service provision	9	1.1
Upstream	Upstream software and IT	1	0.1
	Prime/system integrator	62	7.6
	Launch services	7	0.9
	Launch vehicles and subsystems	22	2.7
	Component/materials supplier	36	4.4
	Testing services	2	0.2
	Upstream support services	4	0.5
	Subsystem supplier	46	5.7
	Robotics	4	0.5
	Satellite/payload manufacturing	95	11.7

Table 14: Distribution of jobs by employer segment and business area in the SCUK dataset.

Space Skills Alliance