EU space skills

Skills needed for a vibrant EU space community

Space is an innovative and constantly evolving sector. To ensure European competitiveness, professional skills must be constantly developed, adopted and improved. Through a series of surveys (71 respondents in total) and desk research, STARS*EU has identified the skills required for space R&I (universities, space agencies, RTOs & others) and the industry.
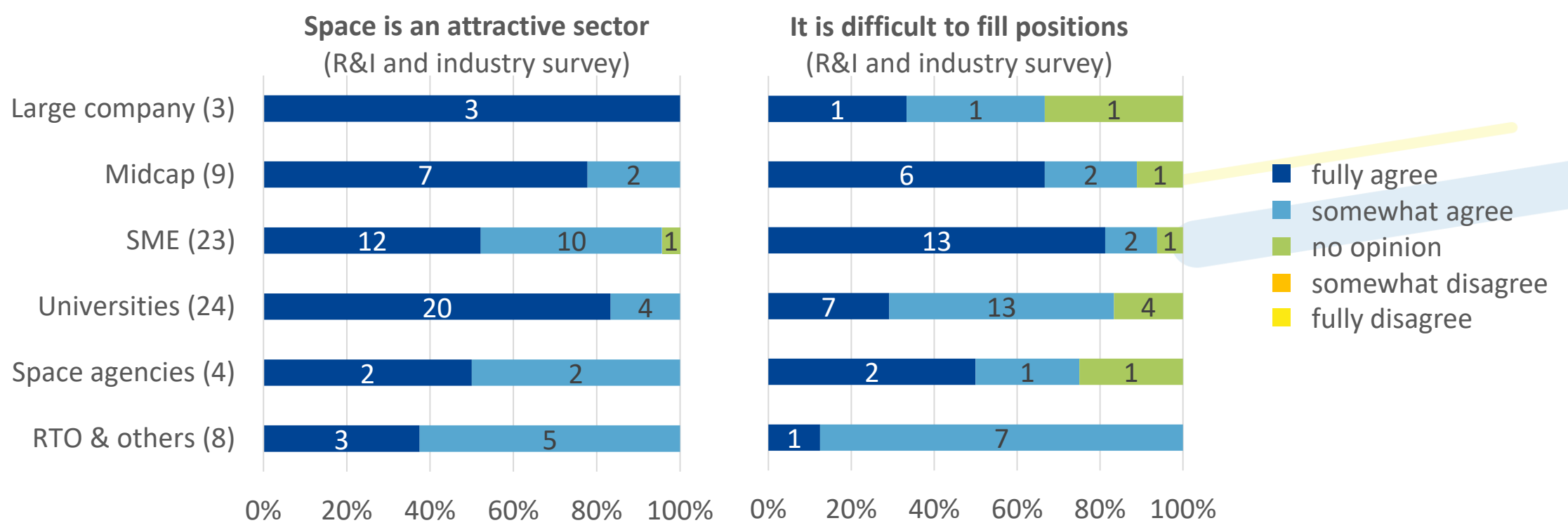
The results of the skill needs analysis show that:

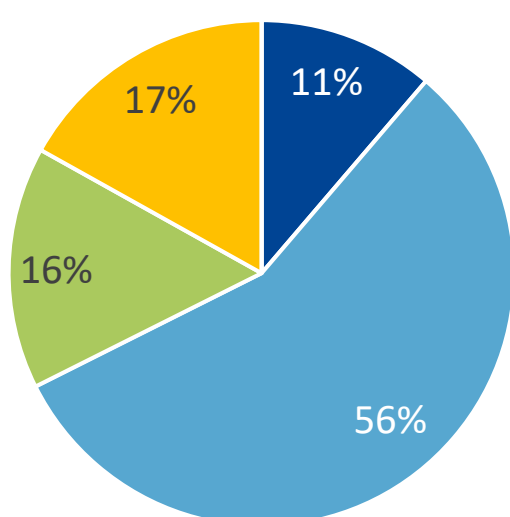- Space is an **attractive sector,** but **positions are hard to fill;**

- **The landscape of space curricula is good,** but there is a shortage of technical skills;

- R&I requires a higher academic profile than industry;

- The most sought-after skills are **science, technology** and **engineering,** but **management & support skills** remain important;

- **Soft skills** are as important as technical skills;

- The European space domain is still dominated by men.

The space community agrees that space is an **attractive domain for young professionals**, both in research and in industry. However, despite the majority of respondents considering the European space curricula landscape as good, it **is difficult to fill positions**. There is a shortage in technical skills and to become operational in the industry, 91% of graduates require additional training.

Space is an attractive sector
(R&I and industry survey)

It is difficult to fill positions
(R&I and industry survey)

Legend:
- fully agree
- somewhat agree
- no opinion
- somewhat disagree
- fully disagree

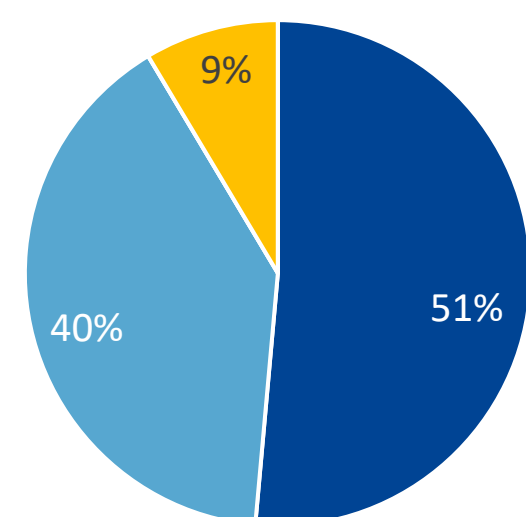**The European landscape of space curricula is good**
(R&I & industry survey, total = 71)

There is a shortage of technical skills applicable to space R&I in Europe
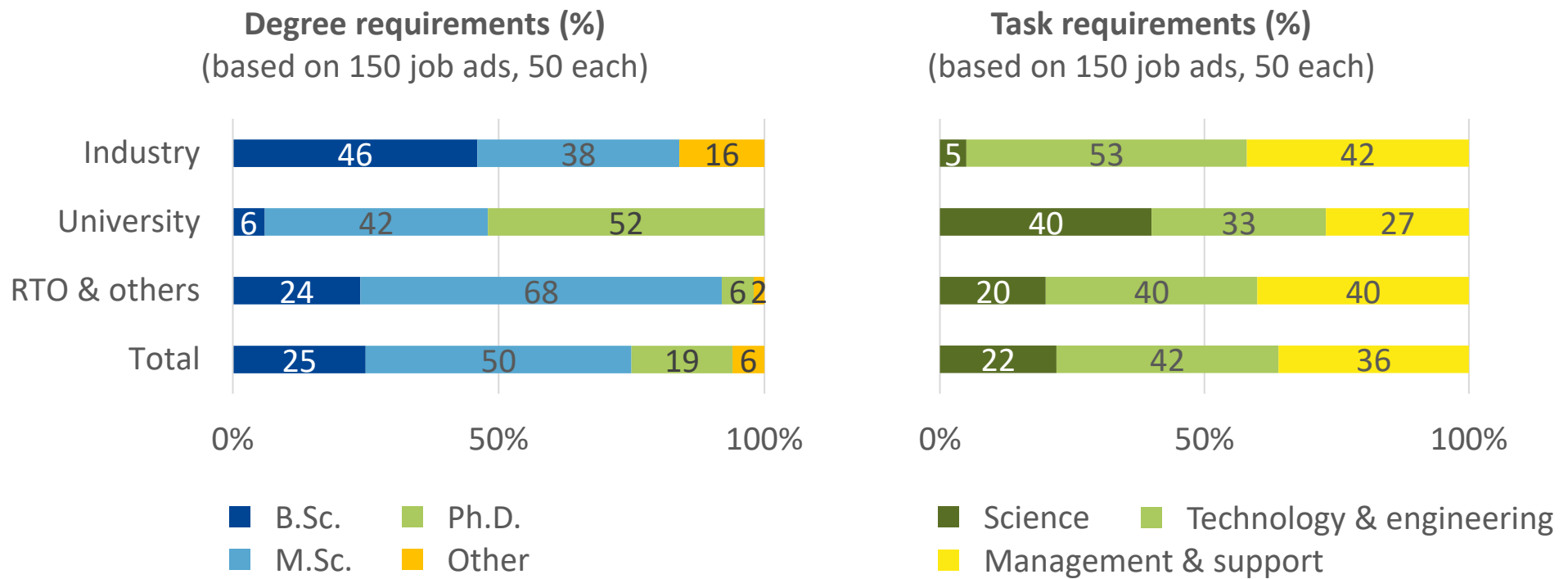(R&I & industry, total = 71)
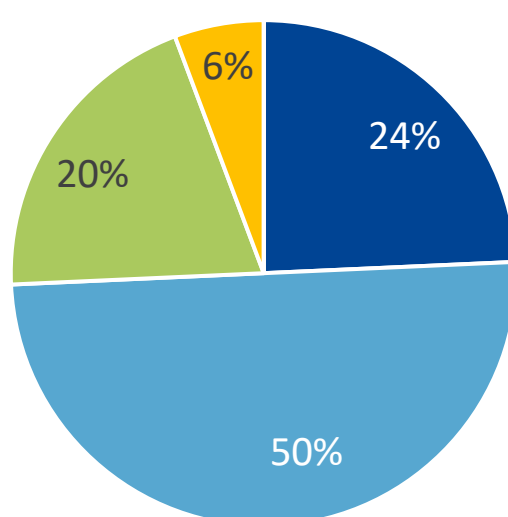
Young graduates must undertake a professional training to become operational
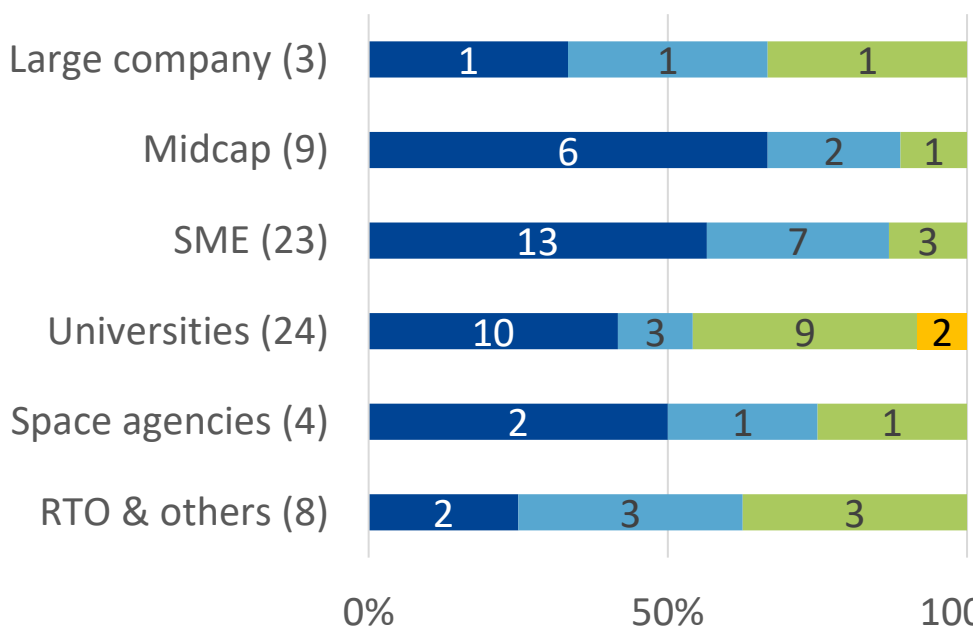(industry survey, total = 35)

Legend: fully agree — somewhat agree — no opinion — somewhat disagree — fully disagree
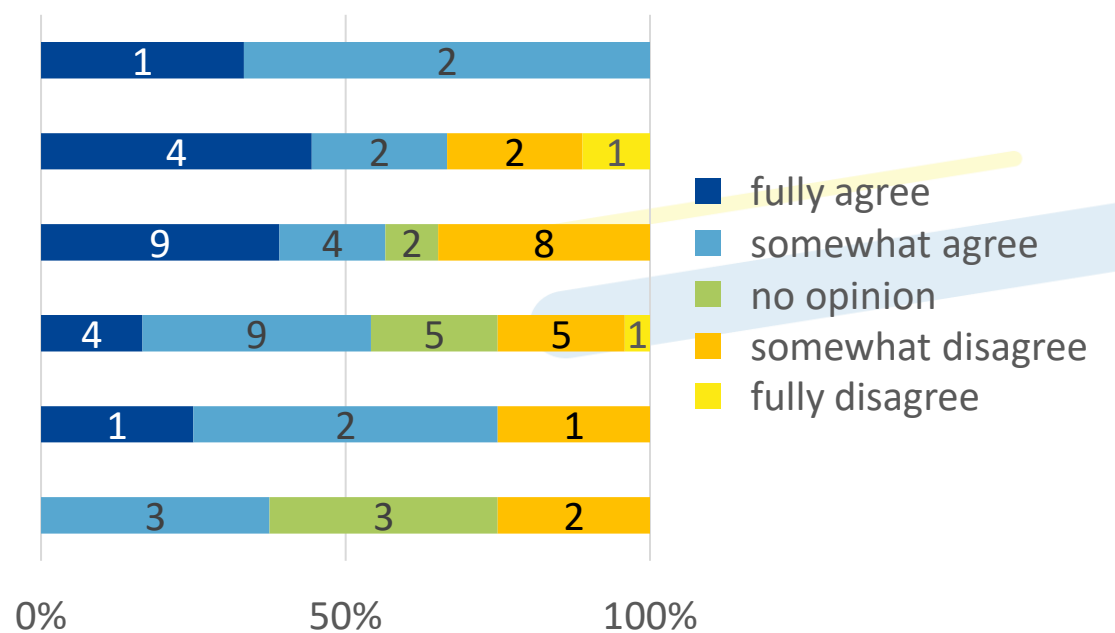
EU space skills

Degree & task requirements vary between organisations. Universities predominantly require Ph.D. degrees. Research institutions & industry look for M.Sc. degrees. On the one hand, science skills are important at universities. On the other, research institutions & industry, technology/engineering & magement/support are more valuable. Furthermore, **soft skills are considered equally important as technical skills** by industry and the R&I community.

Degree requirements (%)
(based on 150 job ads, 50 each)

	B.Sc.	M.Sc.	Ph.D.	Other
Industry	46	38		16
University	6	42	52	
RTO & others	24	68	6	2
Total	25	50	19	6

- ■ B.Sc.
- ■ M.Sc.
- ■ Ph.D.
- ■ Other

Task requirements (%)
(based on 150 job ads, 50 each)

	Science	Technology & engineering	Management & support
Industry	5	53	42
University	40	33	27
RTO & others	20	40	40
Total	22	42	36

- ■ Science
- ■ Technology & engineering
- ■ Management & support

R&I and industry prefer young graduates with a general profile rather than specialists
(R&I and industry survey)

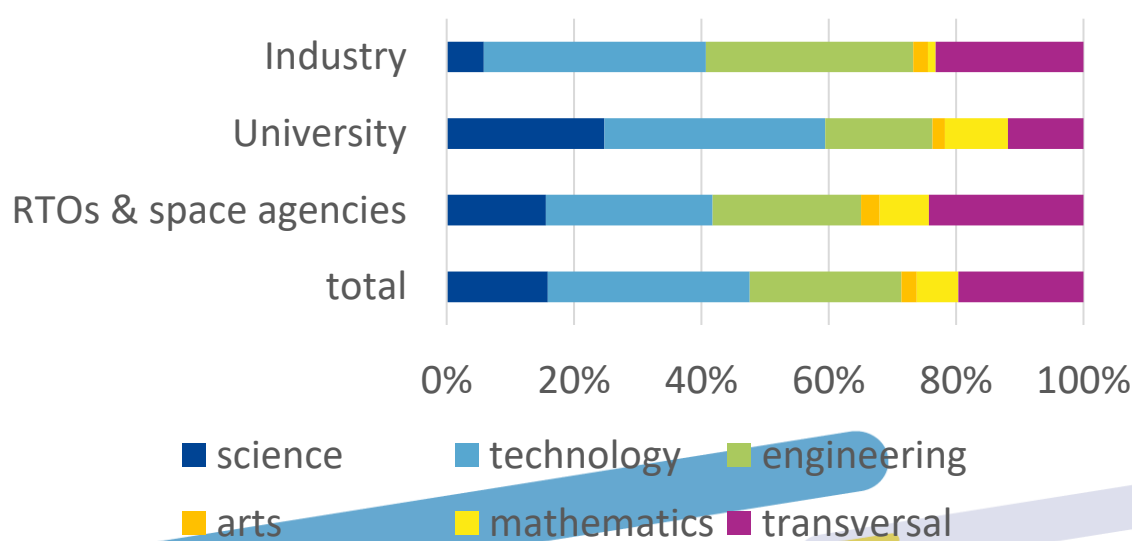|			
Large company (3)	1	1	1
Midcap (9)	6	2	1
SME (23)	13	7	3
Universities (24)	10	3	9	2
Space agencies (4)	2	1	1
RTO & others (8)	2	3	3

R&I and industry consider soft skills as equally important as technical skills
(R&I and industry survey)

Large company (3)	1	2			
Midcap (9)	4	2	2	1	
SME (23)	9	4	2	8	
Universities (24)	4	9	5	5	1
Space agencies (4)	1	2	1		
RTO & others (8)	3	3	2		

- ■ fully agree
- ■ somewhat agree
- ■ no opinion
- ■ somewhat disagree
- ■ fully disagree

Job ad analyses suggest that the most frequently required **hard skills** are **technology** (32%) and **engineering** (24%). Among the **soft skills**, **teamwork** and **communication** skills are in high demand, along with an **independent**, **proactive** and **responsible** way of working.

Required hard skills depending on organisation
(Total = 605)

	science	technology	engineering	arts	mathematics	transversal
Industry						
University						
RTOs & space agencies						
total						

- ■ science
- ■ technology
- ■ engineering
- ■ arts
- ■ mathematics
- ■ transversal

Most frequently mentioned soft skills
(Total = 344)

Categories: Analytical/critical thinking, Innovation and creativity, Research and organisation, Consulting and service, Independent and structured, Flexible and resilient, Proactive and responsible, Open-minded and reflective, Leadership, Teamwork, Intercultural skills, Communication
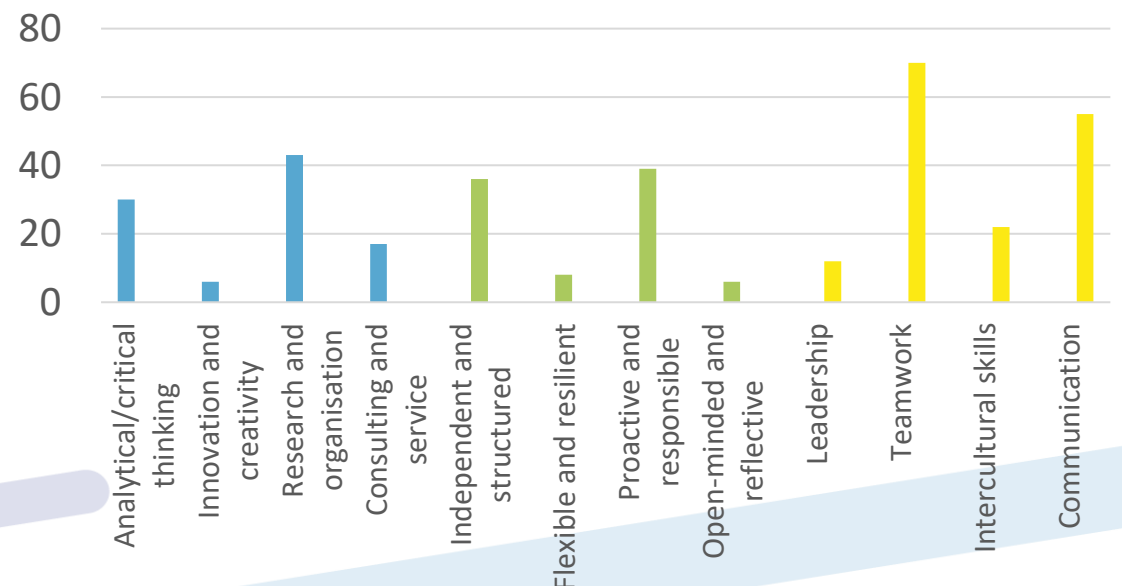
EU space skills

The most sought-after skills in the R&I community are **science**, **technology** & **engineering.**
These skills are **hard to source** on the job market (R&I community survey, 36 answers).

Universities (24) — Demand of skills

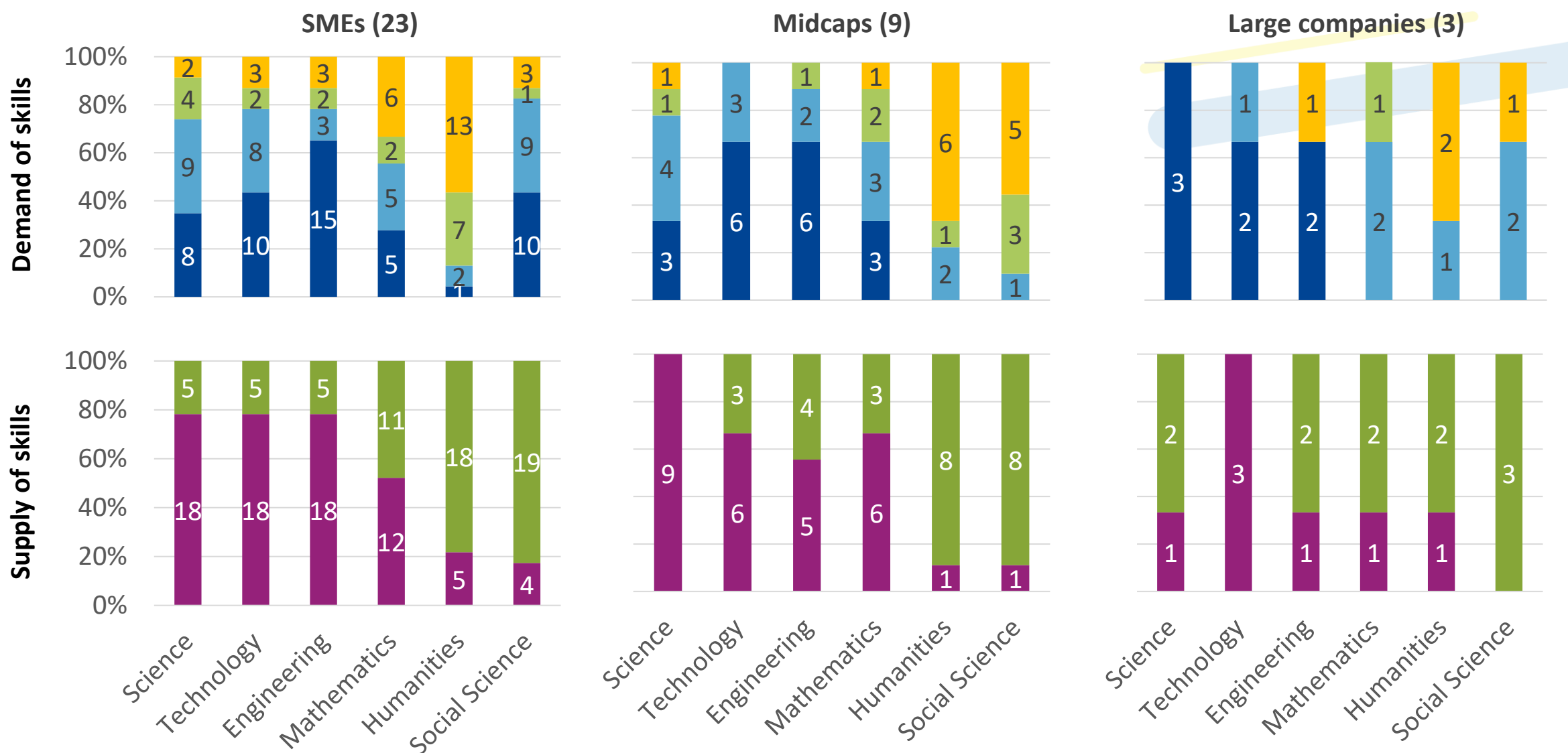| Skill	Values (bottom→top)
Science	17, 4, 3
Technology	11, 10, 3
Engineering	11, 7, 3, 3
Mathematics	8, 10, 4, 2
Arts	1, 6, 16
Transversal	3, 5, 4, 12

Supply of skills: Science 16/8, Technology 16/8, Engineering 12/12, Mathematics 12/12, Arts 6/18, Transversal 2/22

Space agencies (4) — Demand of skills

Skill	Values
Science	1, 2, 1
Technology	3, 1
Engineering	4
Mathematics	3, 1
Arts	3, 1
Transversal	2, 1, 1

Supply of skills: Science 3/1, Technology 4, Engineering 4, Mathematics 3/1, Arts 4, Transversal 4

RTO & others (8) — Demand of skills

Skill	Values
Science	5, 3
Technology	3, 5, 1
Engineering	3, 3, 1, 1
Mathematics	2, 4, 3, 2
Arts	1, 3, 1, 3
Transversal	1, 4, 2, 1

Supply of skills: Science 6/2, Technology 7/1, Engineering 7/1, Mathematics 4/4, Arts 2/6, Transversal 3/5

The results are similar for the space industry. The most sought-after skills **science**, **technology** & **engineering** are **hard to source** on the job market (industry survey, 35 answers).

SMEs (23) — Demand of skills

Skill	Values
Science	8, 9, 4, 2
Technology	10, 8, 2, 3
Engineering	15, 3, 2, 3
Mathematics	5, 5, 2, 6
Humanities	1, 2, 7, 13
Social Science	10, 9, 1, 3

Supply of skills: Science 18/5, Technology 18/5, Engineering 18/5, Mathematics 12/11, Humanities 5/18, Social Science 4/19

Midcaps (9) — Demand of skills

Skill	Values
Science	3, 4, 1, 1
Technology	6, 3
Engineering	6, 2, 1
Mathematics	3, 3, 2, 1
Humanities	2, 1, 6
Social Science	1, 3, 5

Supply of skills: Science 9, Technology 6/3, Engineering 5/4, Mathematics 6/3, Humanities 1/8, Social Science 1/8

Large companies (3) — Demand of skills

Skill	Values
Science	3
Technology	2, 1
Engineering	2, 1
Mathematics	2, 1
Humanities	1, 2
Social Science	2, 1

Supply of skills: Science 1/2, Technology 3, Engineering 1/2, Mathematics 1/2, Humanities 1/2, Social Science 3
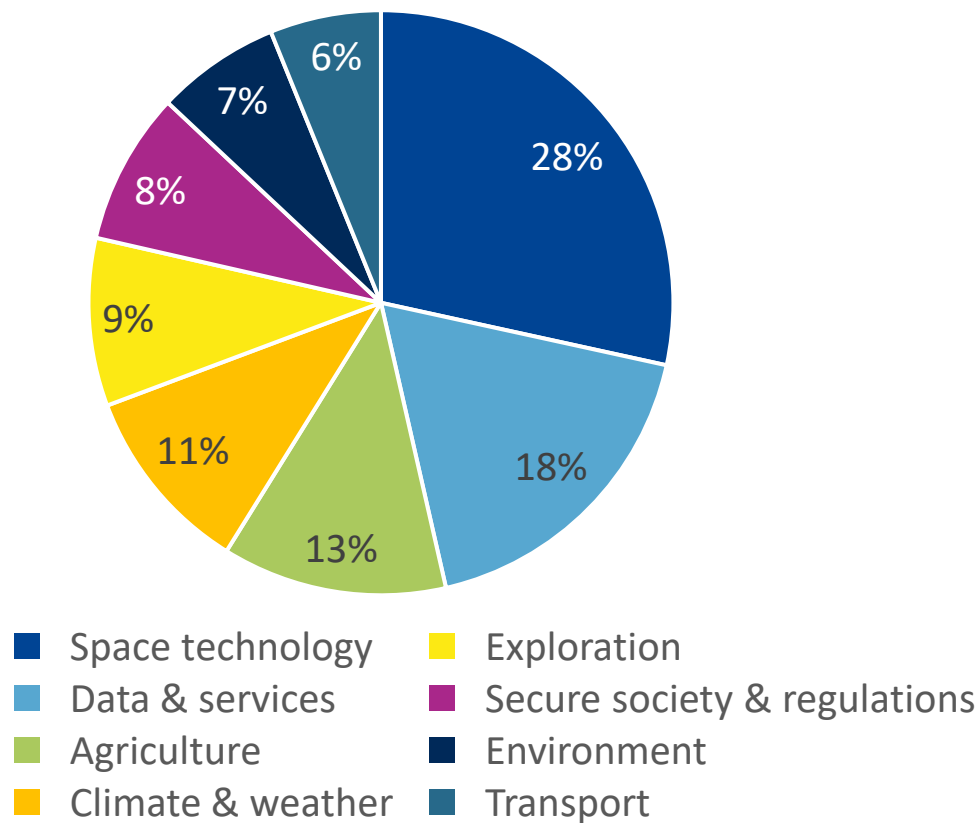
Skills are considererd…
- Essential for the company
- Essential for specific projects/positions
- A nice to have for the company
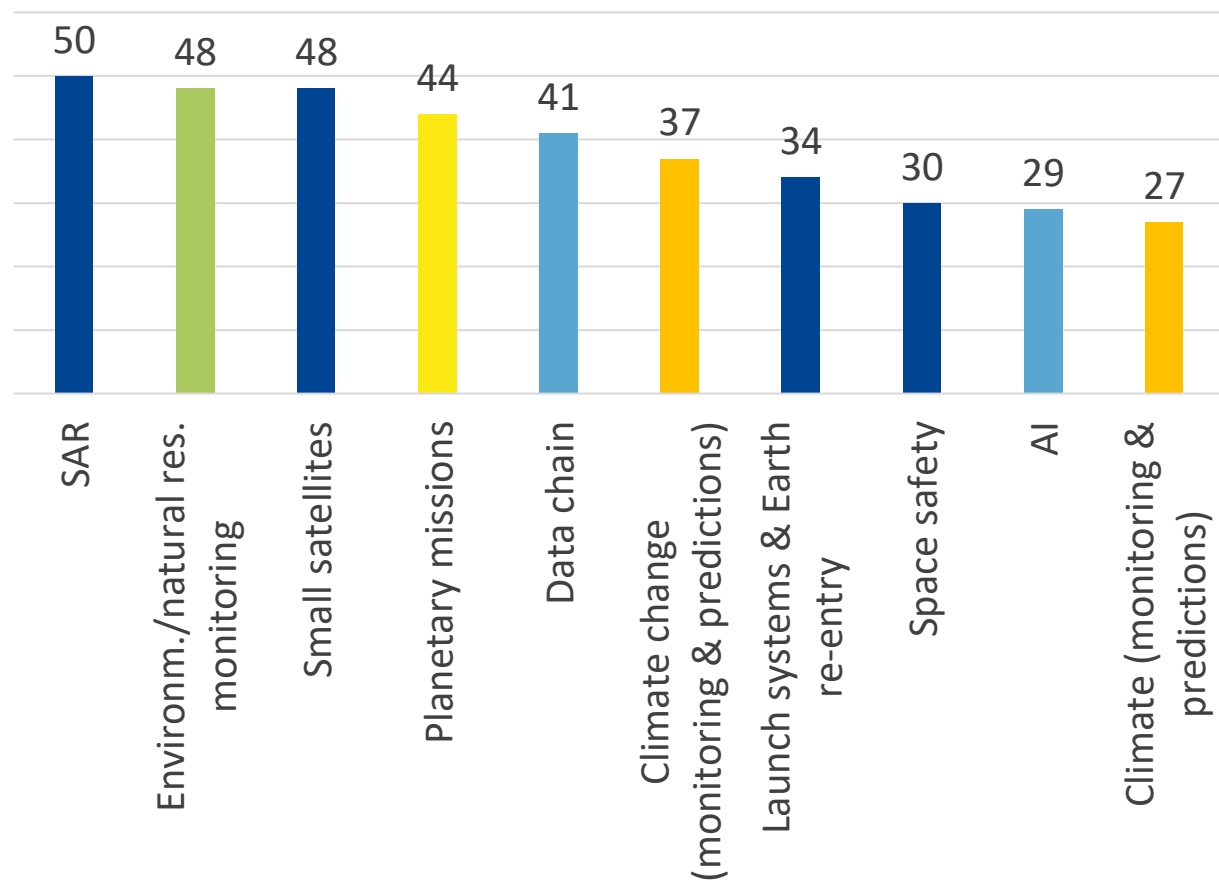- A nice to have for specific projects/positions

Skills are…
- Readily available
- Hard to source

Eight key areas in space R&I were identified. The most important R&I area is **space technologies, with data & services ranked second**. The **ten most important R&I fields of activities** within the eight key areas are shown below.

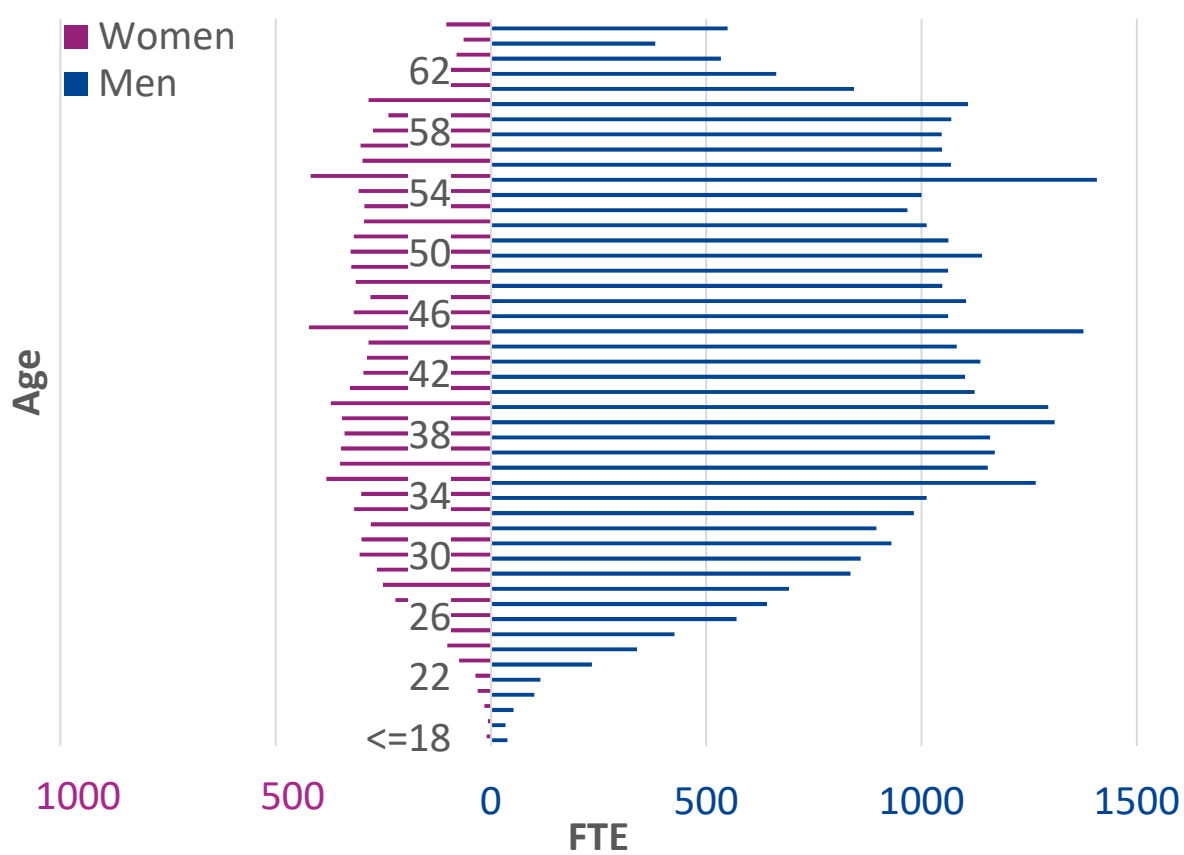**Distribution of the identified key areas in R&I**
(Total = 700)

- Space technology — 28%
- Data & services — 18%
- Agriculture — 13%
- Climate & weather — 11%
- Exploration — 9%
- Secure society & regulations — 8%
- Environment — 7%
- Transport — 6%

Top 10 of current & expected R&I fields of activity
(Total = 700; Total Top 10 = 388)

Field	Value
SAR	50
Environm./natural res. monitoring	48
Small satellites	48
Planetary missions	44
Data chain	41
Climate change (monitoring & predictions)	37
Launch systems & Earth re-entry	34
Space safety	30
AI	29
Climate (monitoring & predictions)	27

Gender equality: Although the number of women working in space is increasing, the is still dominated by men. European space industry employees are **mostly male (75%)**. However, job ad analyses suggest that most employers consider **gender equality** to be **important**.

Space industry employees age pyramid

- Women
- Men

Age / FTE

Gender equality mentioned in job ads
(Total 150, 50 job ads each)

	yes	no
Industry	56	44
University	86	14
RTOs & space agencies	56	44