

IOP Institute of Physics

Physics Students in UK Universities

Data Brief

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Terms of Reference

A description of the data set used, and the terminology used throughout this report is given below.

Source:

The data used in this report is gathered and licenced by the Higher Education Statistics Authority (HESA). The data concerns only staff members at Higher Education institutions and includes information on protected characteristics such as gender and ethnicity.

Students:

Counts of students mean one full time person equivalent at a UK university or higher education provider. Unrounded data includes fractions of students; an individual student could be registered as, say, 0.5 physics and 0.5 mathematics.

Rounding:

Student numbers are rounded up to the nearest 5. If a number of students is shown as 0 or <5, that could represent 1 or 2 students. If 0% is shown, that represents a number of students greater than 0 but less than 0.5%. Blank cells represent no students at all.

Percentages are calculated using unrounded totals, and so it's not always possible to replicate the percentage shown using the rounded totals indicated.

Percentages are only shown if 100% represents more than 22.5 students and are usually rounded to the nearest 1% unless it's necessary to show more detail.

In summary, percentages are correct to within 1%, and student numbers are correct to within 5.

Representation levels:

Representation levels are used to compare the physics student population with the rest of the UK student population.

The representation level is found by:

- Finding the proportion of a subject's students who study a given subject (e.g. 0.8% of UK domiciled Physics students are Bangladeshi)
- Finding the proportion of all students of a given ethnicity across all subjects (e.g. 1.5% of all UK domiciled students in the UK are Bangladeshi)
- Dividing the subject proportion by the overall student population proportion (in this example, $0.8/1.5 = 0.53$, which we interpret as highly under-represented)

The boundaries for representation levels used is as follows:

Difference in proportion	Classification
More than ~1.12 ($\log_{10} \geq 0.05$)	Over-represented
More than ~0.9 ($-0.1 < \log_{10} \leq 0.05$)	Well-represented
More than ~0.8 ($-0.2 < \log_{10} \leq 0.1$)	Slightly under-represented
More than ~0.63 ($-0.4 < \log_{10} \leq 0.2$)	Under-represented
More than ~0.4 ($\log_{10} \leq -0.04$)	Highly under-represented
Up to ~0.39	Extremely under-represented

Table 1: Representation classification.

The representation levels mean the level of representation in a subject or group of subjects relative to the student population, rather than to the UK as a whole; a group could be unrepresented in universities but well represented in a particular subject.

This follows a method devised by Dr. Stephen M Wilkins, Department of Physics and Astronomy, University of Sussex.

Tense:

Some statistics are written as “are” or “is”. This refers to the most recent academic year for which data are available (2018/19).

Location:

All statistics refer to students at UK higher education institutions. The student population means all students, at all levels, at all higher education institutions in the UK.

Selected STEM subjects:

In this report, we compare Physics, Astronomy, Biology, Chemistry, Electronic & electrical engineering, Computer Sciences, and Mathematics. When these are combined, this group is referred to as selected STEM (Science, Technology, Engineering and Maths) subjects in this report. This group of subjects have been selected to benchmark Physics against other subjects.

Gender:

Gender in the document uses the classification in the HESA Sexual Identification data field¹, which broadly reflects students' gender identity and whose available options are Male, Female, and Other. Other is included for students who sex aligns with terms such as intersex, androgyne, intergender, ambigender, gender fluid, polygender and gender queer.

Nationality:

Nationality in this report is based on the domicile of the students and the IOP have grouped these into three categories. The three categories are:

- United Kingdom (UK) – this includes England, Wales, Scotland, Northern Ireland, Guernsey, Jersey and the Isle of Man.
- European Union (EU) – this includes all member nations of the EU.
- Non-EU, Non-UK – this includes all countries that are not included in either category above. In some parts of this report this category maybe referred to as non-EU.

For some students, nationality is unknown. These represent a small number of the overall staff population and are not included in the following analysis.

Ethnicity:

HESA data categorises student ethnicity into the following groups:

- Asian – Indian
- Asian – Pakistani
- Asian – Bangladeshi
- Chinese
- Other Asian background
- Black – Caribbean
- Black – African

¹<https://www.hesa.ac.uk/collection/c17051/a/sexid>

- Other Black background
- Mixed
- White
- Other
- Unknown/Not applicable

Ethnicity isn't known for all students but is recorded more often for UK Domiciled Students. For this reason, non-UK domiciled students are sometimes filtered out of tables and charts which group student numbers by ethnicity.

Polar 5 Quintiles

POLAR is a measure of how likely students in Great Britain are to enter higher education, by small geographical areas, and POLAR 5 is the most recent iteration of POLAR, used in this brief - all small areas in Great Britain are allocated to one of five categories; Category 1 has the lowest rates rate of participation, while Quintile 5 has the highest rate of participation. In the brief, students from quintile 5 are seen as being more educationally advantaged, in the sense that students from those locations are the most likely to access higher education.

Summary

This report details the statistics for Physics students in Higher Education in the UK. Physics is compared to all other academic disciplines grouped together as well as a more detailed analysis of Physics compared to selected STEM subjects. The data set used to understand student trends in Higher Education was provided by the Higher Education Statistics Authority and includes data for the academic years 2010/11 to 2018/19 (the most recent year available). Characteristics such as gender, nationality and ethnicity have been included in order to gain an understanding of the Physics student population and how it compares to other areas within academia.

The key messages identified in this report are as follows:

- The number of Physics students has increased by 30% from 2010/11 to 2018/19.
- The number of 1st year Physics undergraduates has increased 26% from 2010/11 to 2018/19.
- Female Physics students represented 25% of the Physics student population in 2018/19. The number of female undergraduates has increased 49% since 2010/11, and the number of female Physics doctoral students has increased by 40%.
- The number of female Physics students at Russell Group universities has increased by 50% since 2010/11, and 27% at non-Russell Group universities during the same time period.
- The number of European students has increased by 55% since 2010/11. Students from the rest of the world, excluding the UK and Europe, has increased by 56%.
- Every ethnic group has seen an increase in the number of students studying Physics since 2010/11. However, there are still groups that are underrepresented.
- The proportion of Physics students reporting to have a disability has increased from 9% in 2010/11 to 15% in 2018/19.
- Physics students who have disclosed a mental health condition has increased 628% from 2010/11 to 2018/19.
- Students from lower managerial & professional occupations, small employers, own account workers or not classified study Physics in greater numbers than students from any other socio-economic group.

Students (all levels) by Subject

In academic year 2018/19, about 1% of all students in the UK were Physics students: 22,390 in total. A similar number of students studied Chemistry and Electronic & Electrical Engineering. Greater numbers studied Biology and Mathematics. More still studied a computer science; about 5% of all students. The number of students studying Astronomy in 2018/19 was 2,765.

Subject Group	Measure	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Astronomy	Number	2,090	2,095	2,090	2,080	2,115	2,305	2,460	2,690	2,765
	Proportion	0%	0%	0%	0%	0%	0%	0%	0%	0%
Biology	Number	26,790	28,095	28,460	29,045	30,020	30,930	31,695	32,265	32,870
	Proportion	1%	1%	1%	1%	2%	2%	2%	2%	2%
Chemistry	Number	20,575	21,410	21,855	22,790	23,750	24,335	24,540	24,750	23,995
	Proportion	1%	1%	1%	1%	1%	1%	1%	1%	1%
Computer Sciences	Number	86,990	85,650	82,880	85,630	87,920	90,875	96,370	102,720	109,700
	Proportion	5%	4%	4%	4%	5%	5%	5%	5%	5%
Electronic & Electrical Engineering	Number	29,565	29,390	28,575	27,240	26,900	26,555	26,120	25,925	25,685
	Proportion	2%	1%	1%	1%	1%	1%	1%	1%	1%
Mathematics	Number	33,080	35,520	35,955	36,255	36,520	37,170	37,790	38,325	39,370
	Proportion	2%	2%	2%	2%	2%	2%	2%	2%	2%
Physics	Number	17,175	17,810	18,460	19,770	20,840	21,510	21,855	22,050	22,390
	Proportion	1%	1%	1%	1%	1%	1%	1%	1%	1%
All other subjects	Number	1.70m	1.76m	1.72m	1.73m	1.71m	1.74m	1.78m	1.82m	1.84m
	Proportion	89%	89%	89%	89%	89%	89%	89%	89%	89%
Grand Total	Number	1.91m	1.98m	1.94m	1.95m	1.94m	1.97m	2.03m	2.07m	2.09m
	Proportion	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 3: HESA data for the number and proportion of all Physics students and selected STEM subjects for the academic years 2010/11 to 2018/19.

Comparable Subjects

Of the selected STEM subjects, Physics and Astronomy have shown the fastest growth in number of students since 2010/11, as shown in Figure 1. The number of Physics students has grown 30% since 2010/11, with student numbers up by over 5,000 in 2018/19 compared with 2010/11 (**Table 2**).

Upper: Number of students of selected subjects: 2010/11 to 2018/19

Lower: % change since academic year 2010/11

(colours indicate subjects labelled, and are only to help distinguish between subjects)

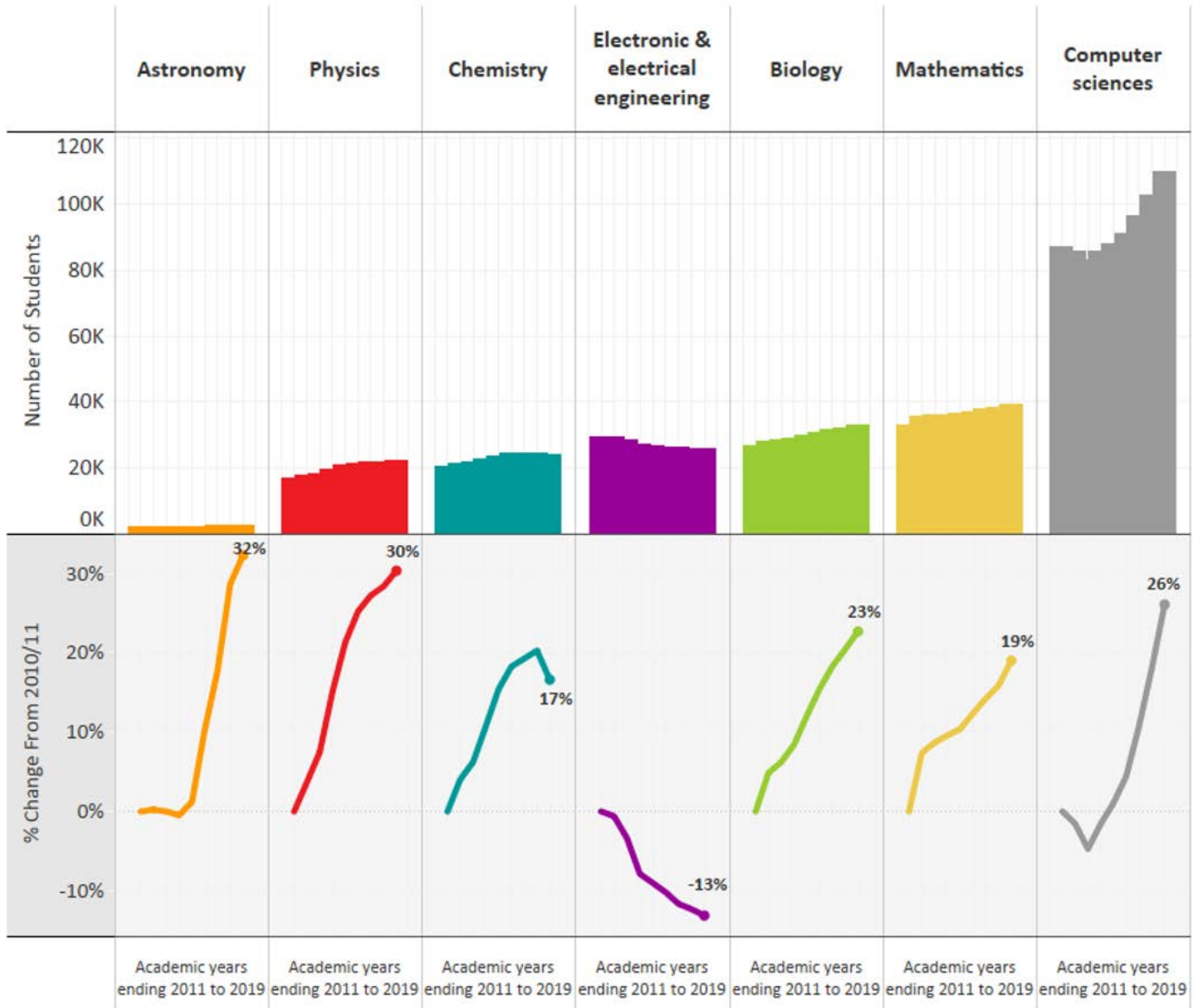


Figure 1: HESA data showing the growth in the number of students for selected STEM subjects from 2010/11 to 2018/19.

Table 3 shows the percentage change in the number of students for selected STEM subjects since 2010/11. Physics (30%) and Astronomy (32%) have the largest percentage increase across the given time period compared to the other subjects in the table.

Subject Group	Measure	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Astronomy	% Change v 2010/11	0%	0%	0%	0%	1%	10%	18%	29%	32%
Biology	% Change v 2010/11	0%	5%	6%	8%	12%	15%	18%	20%	23%
Chemistry	% Change v 2010/11	0%	4%	6%	11%	15%	18%	19%	20%	17%
Computer Science	% Change v 2010/11	0%	-2%	-5%	-2%	1%	4%	11%	18%	26%
Electronic & Electrical Engineering	% Change v 2010/11	0%	-1%	-3%	-8%	-9%	-10%	-12%	-12%	-13%
Mathematics	% Change v 2010/11	0%	7%	9%	10%	10%	12%	14%	16%	19%
Physics	% Change v 2010/11	0%	4%	7%	15%	21%	25%	27%	28%	30%

Table 4: HESA data for the percentage change in the number of students by subject since 2010/11.

Number of First-Year Undergraduates

There has also been an increase in the number of first-year undergraduate Physics students since 2010/11 (up 26%), though growth has slowed. There is a similar trend in the number of Computer Science students. There were 5,195 first year undergraduate Physics Students in total in 2018/19. The number of first-year students studying Astronomy has increased by 25%.

Subject Group	Measure	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Astronomy	Number of Students	475	565	460	400	425	565	480	570	595
	% Change v 2010/11	0%	19%	-3%	-16%	-11%	19%	1%	20%	25%
Biology	Number of Students	7,820	8,475	7,705	8,560	8,995	9,045	8,735	8,865	9,045
	% Change v 2010/11	0%	8%	-1%	9%	15%	16%	12%	13%	16%
Chemistry	Number of Students	5,175	5,355	5,125	5,535	6,025	5,975	5,570	5,465	5,100
	% Change v 2010/11	0%	3%	-1%	7%	16%	15%	8%	6%	-1%
Computer Sciences	Number of Students	24,885	24,730	22,345	25,300	26,230	27,265	28,585	30,245	31,580
	% Change v 2010/11	0%	-1%	-10%	2%	5%	10%	15%	22%	27%
Electronic & Electrical Engineering	Number of Students	7,405	7,520	6,640	6,545	6,455	6,520	6,325	6,225	5,995
	% Change v 2010/11	0%	2%	-10%	-12%	-13%	-12%	-15%	-16%	-19%
Mathematics	Number of Students	10,205	10,795	9,845	10,435	10,455	10,665	10,685	11,300	11,335
	% Change v 2010/11	0%	6%	-4%	2%	2%	5%	5%	11%	11%
Physics	Number of Students	4,125	4,400	4,425	5,120	5,230	5,295	5,090	5,130	5,195
	% Change v 2010/11	0%	7%	7%	24%	27%	28%	23%	24%	26%
All other subjects	Number of Students	457,955	490,315	438,745	460,165	463,065	477,520	482,945	487,565	491,140
	% Change v 2010/11	0%	7%	-4%	0%	1%	4%	5%	6%	7%
All Subjects	Number of Students	518,045	552,155	495,285	522,065	526,875	542,850	548,415	555,360	559,985
	% Change v 2010/11	0%	7%	-4%	1%	2%	5%	6%	7%	8%

Table 5: Number of first year undergraduate students by subject, and % change since 2010/11.

Proportion of Students by Level of Study

Around 78% of Physics students are undergraduates (first degrees and enhanced first degrees¹), 17% are studying for doctorates, and 5% are studying for a (postgraduate) master's degree. Physics and Chemistry are unusual in having far more doctoral students than master's students. Broadly, a similar proportion of Physics students, selected STEM subject students, and all students are undergraduates.



Proportion of all students by academic year, subject, and level of study.

Circles show the proportion at subject level. Faded solid lines show the proportion for the total student population.

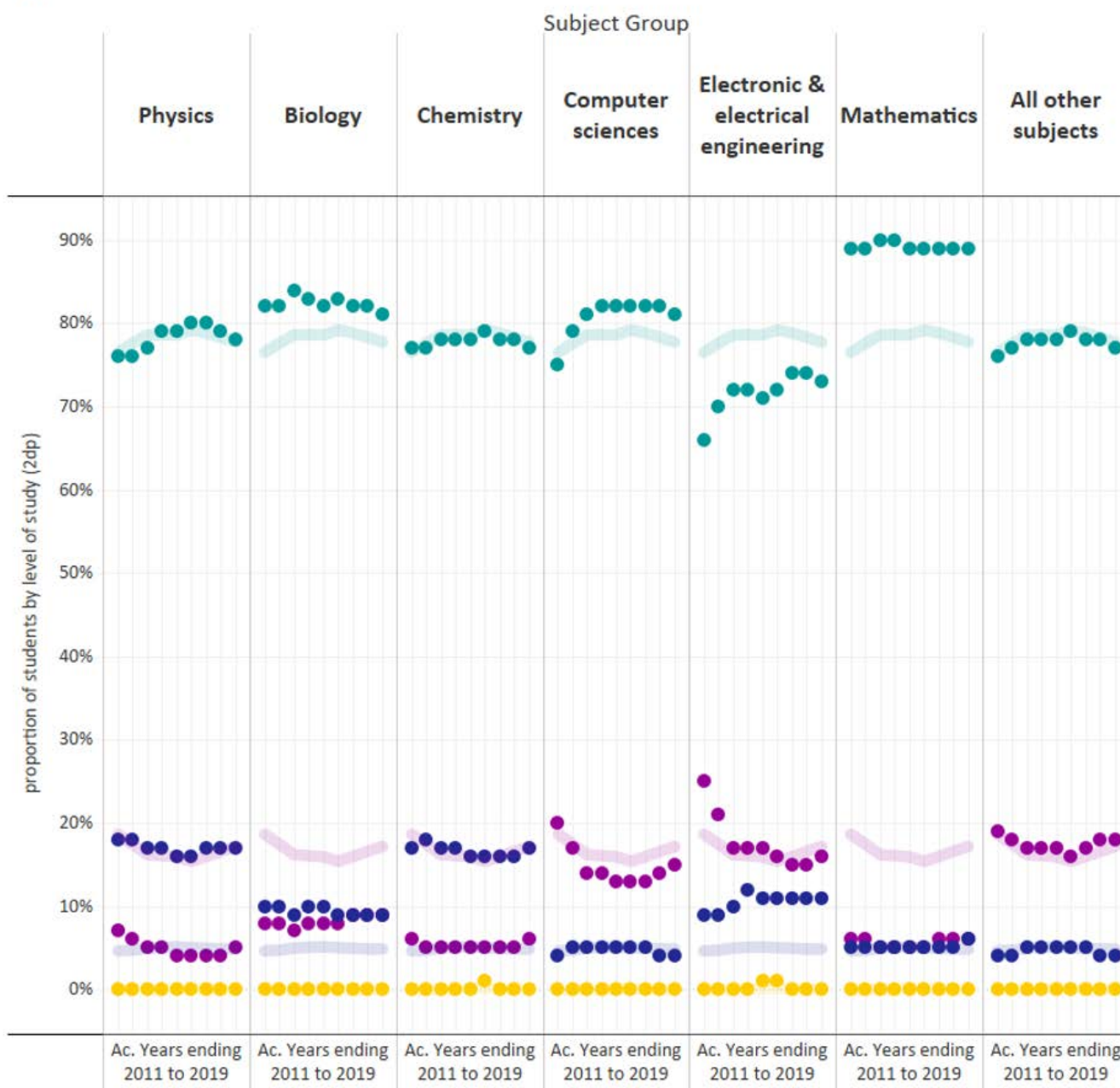


Figure 2: HESA data showing the proportion of all students by academic year, subject and level of study.

² Enhanced first degree programmes typically include study equivalent to at least four years full-time (five in Scotland), of which study equivalent to at least one full-time academic year is at master's level. Study at bachelor's level is integrated with study at master's level: <https://www.hesa.ac.uk/collection/c19051/a/courseaim>

Subject Group	Level of Study	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Astronomy	Undergraduate	81%	81%	80%	80%	78%	77%	74%	73%	75%
	Doctorate	13%	12%	14%	14%	15%	14%	14%	14%	14%
	Master's	6%	7%	6%	6%	7%	8%	11%	12%	11%
	Other post-graduate		0%	0%		0%	0%	0%	0%	0%
Biology	Undergraduate	82%	82%	84%	83%	82%	83%	82%	82%	81%
	Doctorate	10%	10%	9%	10%	10%	9%	9%	9%	9%
	Master's	8%	8%	7%	8%	8%	8%	9%	9%	9%
	Other post-graduate	0%	0%	0%	0%	0%	0%	0%	0%	0%
Chemistry	Undergraduate	77%	77%	78%	78%	78%	79%	78%	78%	77%
	Doctorate	17%	18%	17%	17%	16%	16%	16%	16%	17%
	Master's	6%	5%	5%	5%	5%	5%	5%	5%	6%
	Other post-graduate	0%	0%	0%	0%	0%	1%	0%	0%	0%
Computer Sciences	Undergraduate	75%	79%	81%	82%	82%	82%	82%	82%	81%
	Doctorate	4%	5%	5%	5%	5%	5%	5%	4%	4%
	Master's	20%	17%	14%	14%	13%	13%	13%	14%	15%
	Other post-graduate	0%	0%	0%	0%	0%	0%	0%	0%	0%
Electronic & Electrical Engineering	Undergraduate	66%	70%	72%	72%	71%	72%	74%	74%	73%
	Doctorate	9%	9%	10%	12%	11%	11%	11%	11%	11%
	Master's	25%	21%	17%	17%	17%	16%	15%	15%	16%
	Other post-graduate	0%	0%	0%	0%	1%	1%	0%	0%	0%
Mathematics	Undergraduate	89%	89%	90%	90%	89%	89%	89%	89%	89%
	Doctorate	5%	5%	5%	5%	5%	5%	5%	5%	6%
	Master's	6%	6%	5%	5%	5%	5%	6%	6%	6%
	Other post-graduate	0%	0%	0%	0%	0%	0%	0%	0%	0%
Physics	Undergraduate	76%	76%	77%	79%	79%	80%	80%	79%	78%
	Doctorate	18%	18%	17%	17%	16%	16%	17%	17%	17%
	Master's	7%	6%	5%	5%	4%	4%	4%	4%	5%
	Other post-graduate	0%	0%	0%	0%	0%	0%	0%	0%	0%
All other subjects	Undergraduate	76%	77%	78%	78%	78%	79%	78%	78%	77%
	Doctorate	4%	4%	5%	5%	5%	5%	5%	4%	4%
	Master's	19%	18%	17%	17%	17%	16%	17%	18%	18%
	Other post-graduate	0%	0%	0%	0%	0%	0%	0%	0%	0%
All Subjects	Undergraduate	77%	78%	79%	79%	79%	79%	79%	78%	78%
	Doctorate	5%	5%	5%	5%	5%	5%	5%	5%	5%
	Master's	19%	17%	16%	16%	16%	15%	16%	17%	17%
	Other post-graduate	0%	0%	0%	0%	0%	0%	0%	0%	0%

Table 6: Proportion of students by level of study and academic year.

Physics Students by Gender

In 2018/19 there were 5,450 female Physics students (~24% of the total) and 16,905 male students (~75%). This is a more even split than in 2010/11 when ~22% of Physics students were female, but of the selected STEM subjects only Electronic & Electrical Engineering, and Computer Sciences, have a less even gender split.

The number of female Physics students has increased each year since 2011/12, while the number of male students has remained steady since reaching 16,800 in 2015/16.

In fact, all the STEM subjects compared (except Mathematics) and the total student population, have seen a growing proportion of female students since 2010/11.

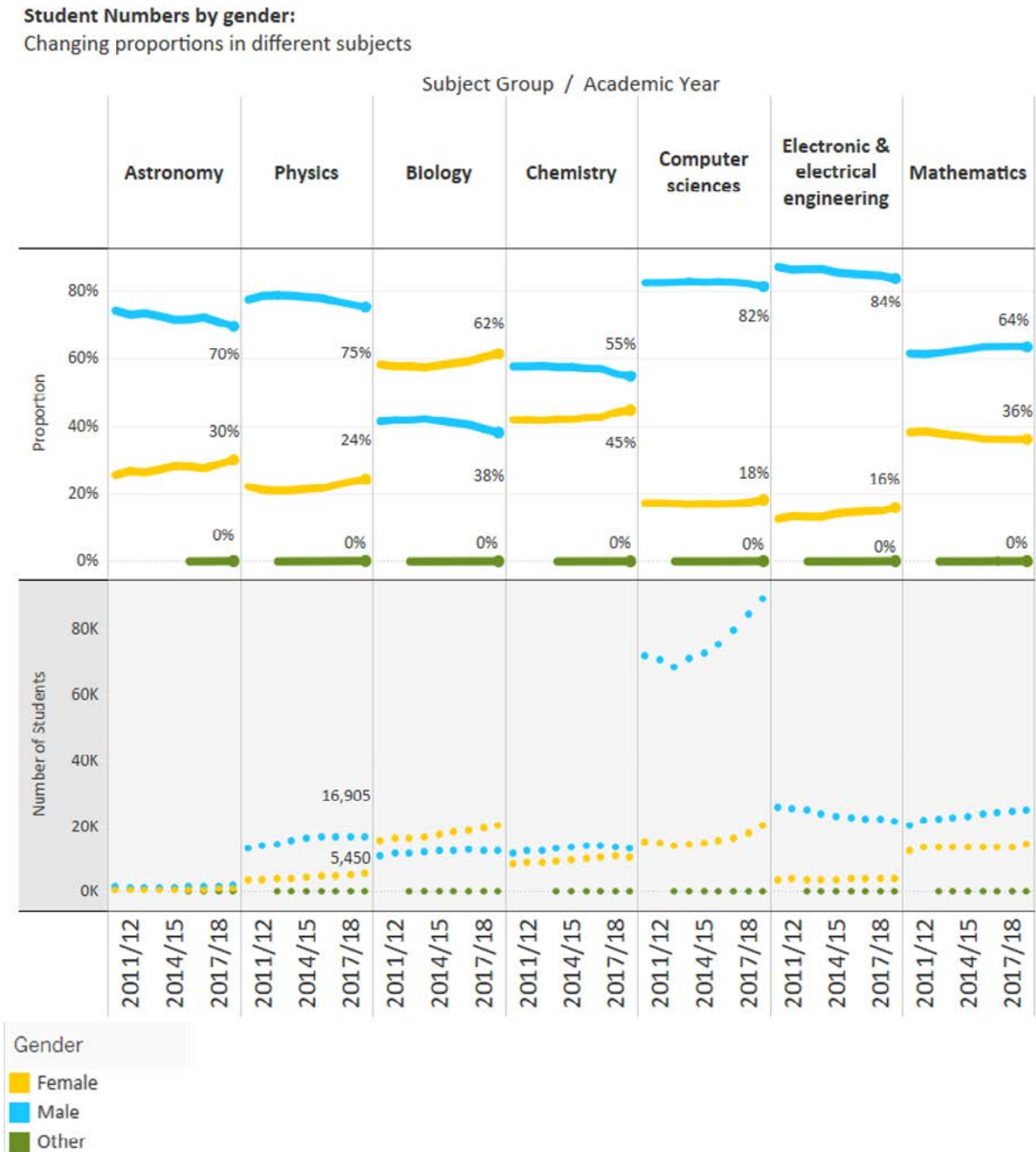


Figure 3: HESA data for selected STEM students by gender

Subject Group	Gender	Measures	2010/11	2014/15	2018/19
Physics	Female	Number of Students	3,820	4,480	5,450
		Proportion	22%	21%	24%
	Male	Number of Students	13,355	16,350	16,905
		Proportion	78%	78%	75%
	Other	Number of Students		10	35
		Proportion		0%	0%
Astronomy	Female	Number of Students	535	600	835
		Proportion	26%	28%	30%
	Male	Number of Students	1,550	1,515	1,930
		Proportion	74%	72%	70%
	Other	Number of Students			5
		Proportion			0%
Biology	Female	Number of Students	15,665	17,495	20,265
		Proportion	58%	58%	62%
	Male	Number of Students	11,125	12,520	12,585
		Proportion	42%	42%	38%
	Other	Number of Students		5	20
		Proportion		0%	0%
Chemistry	Female	Number of Students	8,650	10,025	10,785
		Proportion	42%	42%	45%
	Male	Number of Students	11,925	13,725	13,195
		Proportion	58%	58%	55%
	Other	Number of Students		5	10
		Proportion		0%	0%
Computer sciences	Female	Number of Students	15,050	15,040	20,080
		Proportion	17%	17%	18%
	Male	Number of Students	71,940	72,860	89,505
		Proportion	83%	83%	82%
	Other	Number of Students		20	110
		Proportion		0%	0%
Electronic & electrical engineering	Female	Number of Students	3,755	3,835	4,110
		Proportion	13%	14%	16%
	Male	Number of Students	25,810	23,060	21,550
		Proportion	87%	86%	84%
	Other	Number of Students		5	25
		Proportion		0%	0%
Mathematics	Female	Number of Students	12,690	13,510	14,275
		Proportion	38%	37%	36%
	Male	Number of Students	20,390	23,010	25,055
		Proportion	62%	63%	64%
	Other	Number of Students		5	40
		Proportion		0%	0%
All other subjects	Female	Number of Students	969,975	996,510	1,096,920
		Proportion	57%	58%	60%
	Male	Number of Students	726,365	712,970	739,650
		Proportion	43%	42%	40%
	Other	Number of Students	<5	220	1,600
		Proportion	0%	0%	0%

Table 7: HESA data for selected STEM subjects, and all other subjects, by gender.

Gender by Higher Education Provider (HEP) Region

The gender breakdown for Physics and Astronomy students for HEP region shows that universities in Scotland have the highest proportion of female Physics students (29%). The proportion of female Physics students at Scottish Higher Education institution has increased by 5 percentage points (the largest increase seen) since 2010/11. Wales has the joint lowest proportion of female Physics students (24%); however, this has improved 3 percentage points since 2010/11. The demographic of London's student population does differ from the rest of the UK. Excluding London, the rest of England is joint bottom for female representation amongst Physics students (24%), an increase of 2 percentage points since 2010/11. The proportion of female Physics students at London based Higher Education institutions is 27%, however this proportion is the same as in 2010/11.

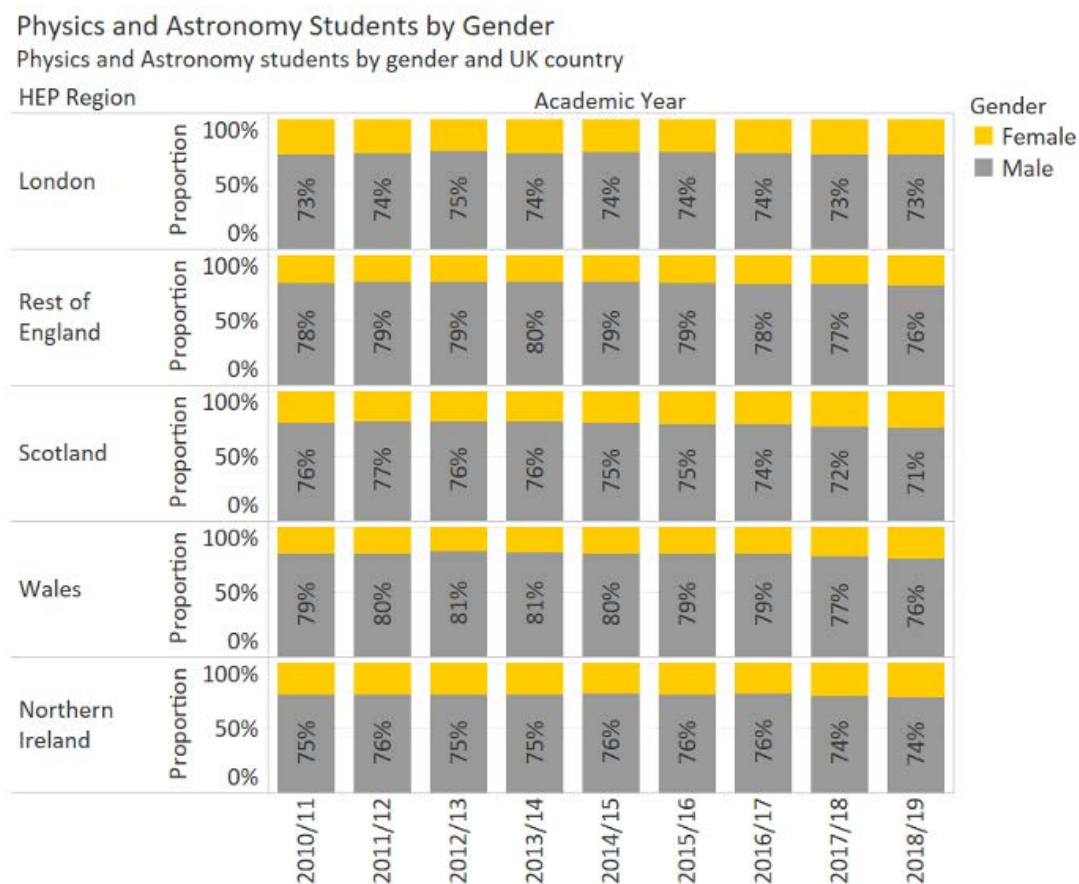


Figure 4: HESA data for Physics students by gender and HEP region for academic years 2010/11 to 2018/19.

Gender by UK Domicile

Figure 5 shows the breakdown of Physics students by gender and UK domicile. From the figure, students from Wales have the highest proportion of male students (81%) for Physics. Students from Northern Ireland have the lowest proportion students who are male (72%).

The proportion of female Physics students from England and Northern Ireland has increased since 2010/11. For both Scotland and Wales, the proportion of female Physics students has decreased by 2 percentage points and 1 percentage point, respectively.

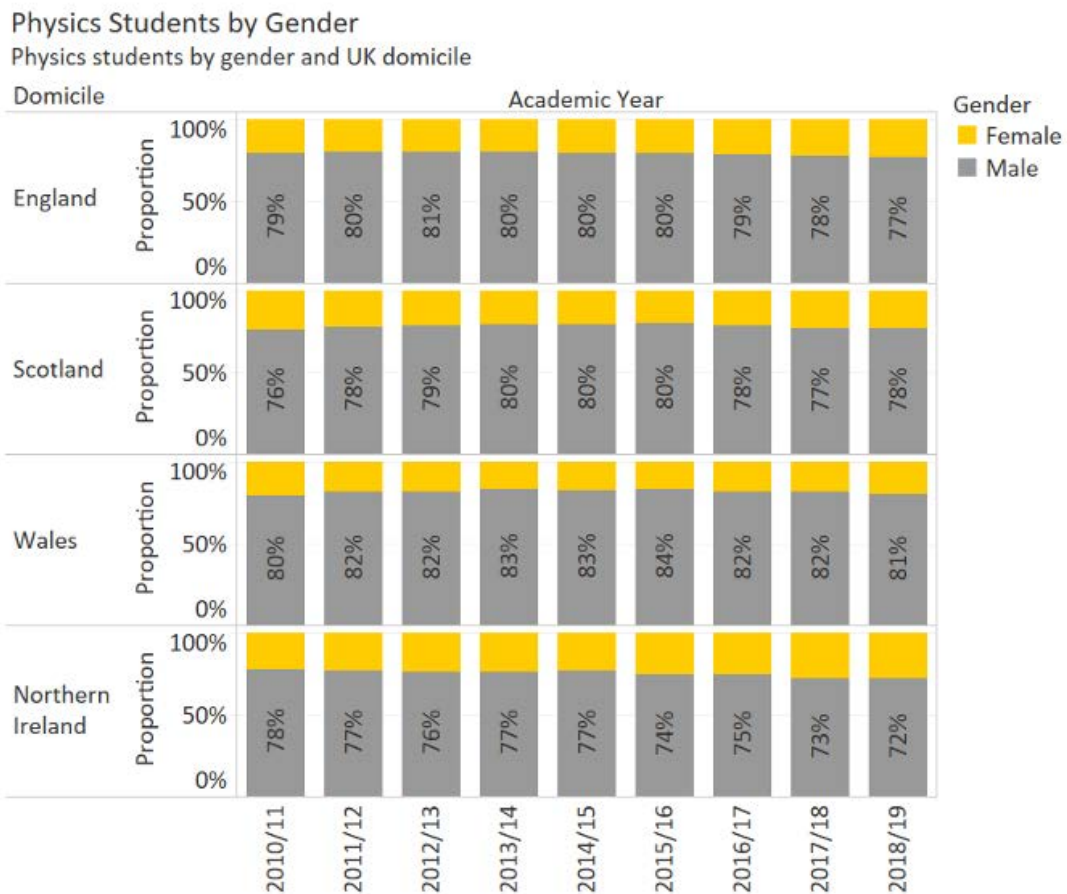


Figure 5: HESA data for Physics and Astronomy students by gender and UK country. Note that Physics and Astronomy have been grouped together to respect anonymity conventions.

Gender by Nationality

Figure 6 shows that, in 2018/19, 23% of Physics students from the UK were female. This proportion is lower than female Physics students from Europe (31%) and the rest of the world (30%).

The proportion of female students from the UK has increased by 2 percentage points since 2010/11. The increase seen for those female Physics students from Europe was 4 percentage points. In total, the proportion of Physics students from the rest of the world who are female has decreased by 1 percentage point since 2010/11.

Physics Students by Gender
Physics students by gender and nationality

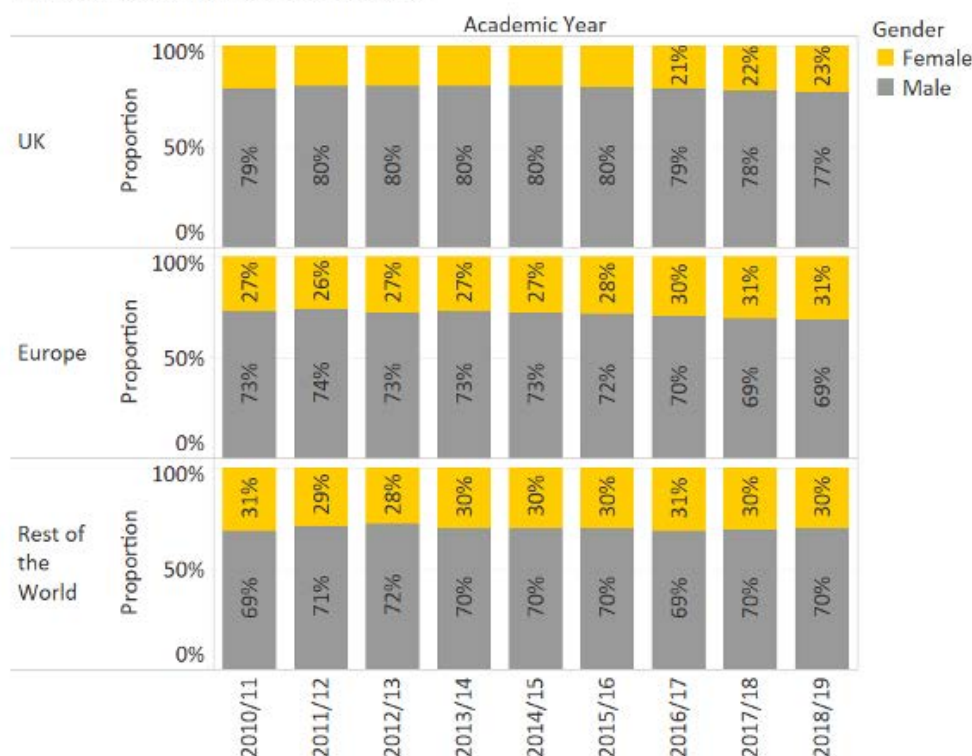


Figure 6: HESA data for Physics students by gender and nationality for academic years 2010/11 to 2018/19.

Gender by Degree Level

Table 7 breaks down each degree level for Physics by gender. Shown in the table is the total number of students studying at each degree level, the proportion of students by gender for each degree level and the percentage change since 2010/11. The number of female Physics undergraduates increased by 49% from 2010/11 to 2018/19, and now represents 24% of Physics undergraduates, compared with 22% in 2010/11. Females are more represented at postgraduate level in Physics (30%) compared to other levels of study; however, the total number of female Physics postgraduates did not increase over the same period of time, in fact, for most years looked at, there were fewer female Physics postgraduates than in 2010/11 and overall, the total number of Physics postgraduate students has declined. The number of Physics postgraduates did increase between 2016/17 to 2018/19. The number of female doctoral Physics students has increased by 40%. In 2018/19, 25% of Physics doctoral students were female.

Level of Study	Gender	Academic Year									Percentage Change
		2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	
Undergraduate	Female	2,800	2,765	2,925	3,170	3,405	3,610	3,850	4,050	4,160	49%
		22%	21%	21%	20%	21%	21%	22%	23%	24%	
	Male	10,175	10,695	11,335	12,350	13,055	13,560	13,540	13,375	13,295	31%
		78%	79%	79%	80%	79%	79%	78%	77%	76%	
Postgraduate	Female	310	295	235	255	255	225	225	230	310	0%
		28%	27%	24%	27%	25%	25%	27%	26%	30%	
	Male	810	800	745	700	760	670	610	640	730	-10%
		72%	73%	76%	73%	75%	75%	73%	74%	70%	
Doctorate	Female	705	710	720	750	820	840	895	930	985	40%
		23%	22%	22%	23%	24%	25%	25%	25%	25%	
	Male	2,370	2,540	2,500	2,540	2,535	2,590	2,715	2,800	2,885	22%
		77%	78%	78%	77%	76%	75%	75%	75%	75%	

Table 7: HESA data for Physics students by gender and degree level for academic years 2010/11 to 2018/19.

Gender by Physics Undergraduates

Figure 7 shows 24% of Physics undergraduates are female. This proportion is similar to the 25% seen for the whole of the Physics student population.

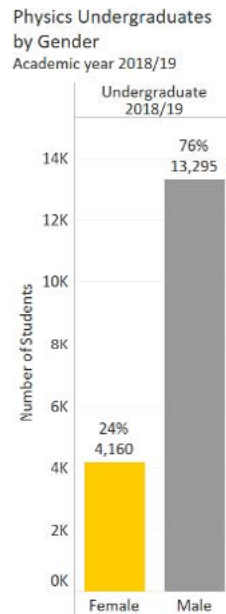


Figure 9: HESA data for Physics postgraduates by gender for 2018/19.

Gender by First Year Group Marker

Figure 8 shows the total number of first year Physics students by gender. The number of first year Physics students who are female has increased from 1,320 to 1,825, an increase of 38%. During the same time period, the number of male first year Physics students increased by 20%.

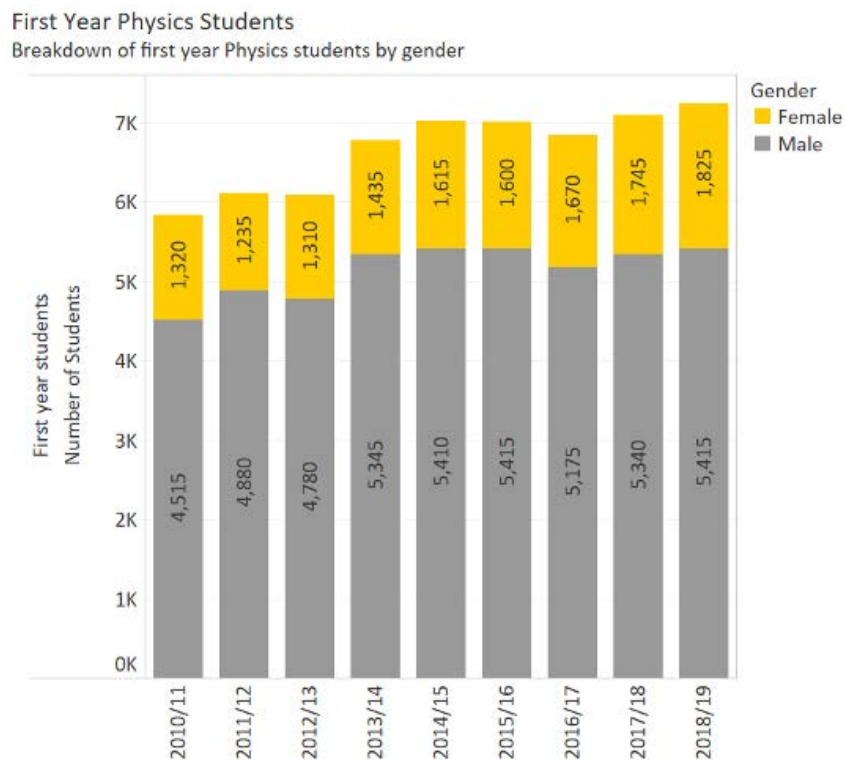


Figure 8: HESA data for first year Physics students by gender for academic years 2010/11 to 2018/19.

Gender by Physics Postgraduates

Figure 9 shows that 26% of Physics postgraduates are female. This proportion of female Physics students for postgraduates is slightly greater than for Physics undergraduates.

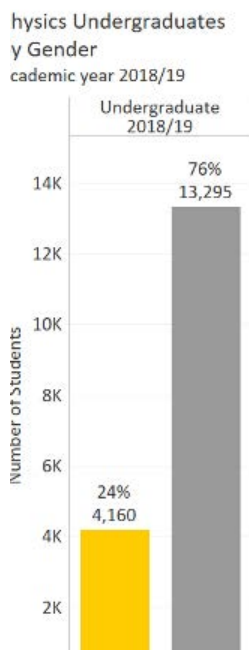


Figure 9: HESA data for Physics postgraduates by gender for 2018/19.

Gender by Russell and Non-Russell Group Universities

The Russell Group is a group of 24 UK based Universities which are world class and research intensive. The proportion of Physics students at Russell and non-Russell group universities by gender are similar (approximately 1 in 4 students at Russell Group and non-Russell Group universities are female) and for both, the proportion of female students have increased since 2010/11. The number of female Physics students at non-Russell Group universities has increased by 27% between 2010/11 to 2018/19. During the same time, male students has increased by 29%. At Russell Group universities, the number of female Physics students have increase from 2,540 to 3,820, an increase of 50%, while male students increased by 25%.

Institution Category	Gender	Academic Year										Percentage Change
		2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19		
Non-Russell Group	Female	1,280	1,160	1,215	1,280	1,400	1,470	1,565	1,580	1,630	27%	
		23%	21%	21%	20%	20%	21%	22%	22%	23%		
	Male	4,290	4,375	4,600	5,135	5,530	5,675	5,675	5,580	5,530	29%	
		77%	79%	79%	80%	80%	79%	78%	78%	77%		
Russell Group	Female	2,540	2,610	2,665	2,895	3,080	3,210	3,410	3,625	3,820	50%	
		22%	21%	21%	22%	22%	22%	23%	24%	25%		
	Male	9,065	9,665	9,980	10,455	10,820	11,145	11,190	11,230	11,375	25%	
		78%	79%	79%	78%	78%	78%	77%	76%	75%		

Table 9: HESA data for Physics students by gender and by Russell Group and Non-Russell Group universities from 2010/11 to 2018/19.

Table 10 details the proportion of STEM subject students studying at Russell and non-Russell group universities by gender from 2010/11 to 2018/19. Physics has the highest proportion of students studying at a Russell group university (68%) in 2018/19; a total of 17% of female Physics students study at Russell Group universities (51% for male students) and 7% are at non-Russell Group universities (25% for male students).

Discipline	Gender	Institution Category	Academic Year								
			2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Physics	Female	Non-Russell Group	7%	7%	7%	6%	7%	7%	7%	7%	7%
		Russell Group	15%	15%	14%	15%	15%	15%	16%	16%	17%
	Male	Non-Russell Group	25%	25%	25%	26%	27%	26%	26%	25%	25%
		Russell Group	53%	54%	54%	53%	52%	52%	51%	51%	51%
Astronomy	Female	Non-Russell Group	14%	14%	14%	13%	13%	14%	13%	13%	14%
		Russell Group	12%	13%	12%	14%	16%	15%	15%	16%	16%
	Male	Non-Russell Group	44%	42%	37%	35%	35%	38%	38%	37%	35%
		Russell Group	30%	31%	36%	37%	37%	34%	34%	34%	35%
Biology	Female	Non-Russell Group	35%	35%	36%	36%	36%	36%	35%	36%	37%
		Russell Group	23%	23%	22%	22%	23%	23%	24%	25%	25%
	Male	Non-Russell Group	25%	26%	27%	27%	26%	26%	25%	24%	24%
		Russell Group	16%	16%	15%	15%	16%	15%	15%	15%	15%
Chemistry	Female	Non-Russell Group	19%	19%	19%	19%	19%	18%	17%	18%	18%
		Russell Group	23%	23%	23%	23%	24%	25%	25%	26%	27%
	Male	Non-Russell Group	25%	25%	26%	25%	25%	24%	24%	23%	22%
		Russell Group	33%	33%	32%	33%	32%	33%	33%	33%	33%
Computer sciences	Female	Non-Russell Group	14%	14%	14%	14%	13%	13%	13%	13%	13%
		Russell Group	3%	3%	3%	3%	4%	4%	4%	5%	5%
	Male	Non-Russell Group	70%	70%	70%	69%	68%	68%	67%	66%	64%
		Russell Group	12%	13%	13%	14%	15%	15%	16%	17%	17%
Electronic & electrical engineering	Female	Non-Russell Group	8%	8%	7%	7%	8%	8%	7%	7%	7%
		Russell Group	5%	6%	6%	6%	7%	7%	8%	8%	9%
	Male	Non-Russell Group	60%	58%	57%	56%	54%	53%	52%	50%	48%
		Russell Group	27%	28%	29%	31%	32%	32%	33%	35%	36%
Mathematics	Female	Non-Russell Group	20%	21%	21%	20%	20%	19%	18%	18%	17%
		Russell Group	18%	17%	17%	17%	17%	18%	18%	18%	19%
	Male	Non-Russell Group	31%	32%	32%	32%	31%	31%	30%	29%	28%
		Russell Group	30%	29%	30%	31%	32%	33%	34%	34%	35%

Table 10: HESA data for selected STEM students by gender and Russell and non-Russell group for academic years 2010/11 to 2018/19.

³<https://russellgroup.ac.uk/about/our-universities/>

Physics Students by Nationality

The majority of Physics students studying at Higher Education institutions in the UK are from the UK. From 2010/11 to 2018/19, the number of students studying Physics from the UK increased by approximately 3,600 students representing a 25% increase, see Table 10. Only Computer Sciences saw a larger percentage increase in student numbers than Physics did.

European students studying Physics in the UK increased by 55% from 1,535 to 2,385. A similar increase, and comparable student numbers, to Biology and Mathematics.

Physics students from the rest of the world increased by 56% over the period of time looked at, the largest increase out of all selected STEM subjects, with the exception of Astronomy. In 2010/11, the number of Physics students from the rest of the world was 1,345, by 2018/19 this figure had risen to 2,100.

Nationality	Subjects	Academic Year									Percentage Change
		2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	
UK	Physics	14,295	14,875	15,380	16,435	17,315	17,830	17,925	17,975	17,905	25%
	Astronomy	1,875	1,850	1,785	1,775	1,770	1,935	2,040	2,240	2,280	22%
	Biology	23,005	24,070	24,455	24,790	25,470	26,160	26,845	27,155	27,365	19%
	Chemistry	17,305	17,975	18,370	19,015	19,620	20,050	20,105	20,215	19,210	11%
	Computer sciences	63,460	64,895	64,320	67,385	69,415	72,190	76,840	80,955	84,050	32%
	Electronic & electrical engineering	14,995	15,795	15,765	14,835	14,530	14,595	14,790	14,380	13,825	-8%
	Mathematics	27,440	29,500	29,690	29,730	29,710	30,230	30,665	30,965	31,285	14%
European	Physics	1,535	1,625	1,725	1,865	1,940	2,040	2,175	2,250	2,385	55%
	Astronomy	125	135	180	190	195	200	230	235	255	104%
	Biology	1,860	1,995	2,010	2,160	2,265	2,435	2,580	2,750	2,920	57%
	Chemistry	1,210	1,300	1,385	1,530	1,625	1,720	1,840	1,900	1,970	63%
	Computer sciences	5,955	6,235	6,315	6,585	7,000	7,740	8,750	9,675	10,445	75%
	Electronic & electrical engineering	2,225	2,375	2,380	2,320	2,380	2,330	2,260	2,270	2,190	-2%
	Mathematics	1,835	1,940	2,100	2,165	2,285	2,415	2,565	2,670	2,810	53%
Rest of the World	Physics	1,345	1,305	1,350	1,470	1,585	1,640	1,760	1,825	2,100	56%
	Astronomy	90	110	125	115	150	170	190	215	230	156%
	Biology	1,925	2,030	1,995	2,095	2,285	2,340	2,270	2,365	2,585	34%
	Chemistry	2,065	2,135	2,100	2,245	2,505	2,565	2,590	2,635	2,815	36%
	Computer sciences	17,570	14,520	12,245	11,660	11,505	10,945	10,780	12,090	15,205	-13%
	Electronic & electrical engineering	12,345	11,220	10,430	10,080	9,990	9,630	9,070	9,270	9,670	-22%
	Mathematics	3,800	4,080	4,170	4,360	4,525	4,525	4,555	4,685	5,275	39%

Table 11: HESA data for STEM students by nationality for the academic years 2010/11 to 2018/19.

Figure 10 shows that, in 2018/19, 80% of Physics students were from the UK. This figure has decreased by 3 percentage points since 2010/11. Students from Europe represent 9% of Physics in 2010/11, this increased to 11% by 2018/19. Students from the rest of the world represent 9% of Physics students in 2018/19, up 1 percentage point from 2010/11.

Physics Students by Nationality
 Proportion of Physics students by nationality for academic years 2010/11 to 2018/19.

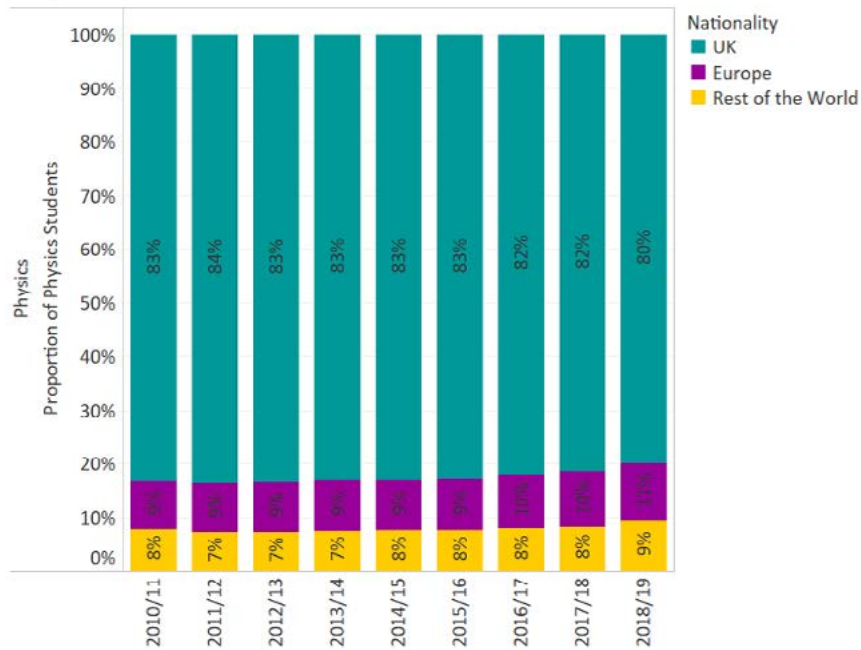


Figure 10: HESA data for Physics students by nationality for the academic years 2010/11 to 2018/19.

Students by Ethnicity

In this section, the ethnicity of the student population is analysed.

Ethnicity – Overview

Overall, Black African and Caribbean students are the least-well represented students in Physics; both are extremely under-represented. Chinese, Mixed, White, and Indian students make up a higher proportion of the Physics-student population than of the overall student population.

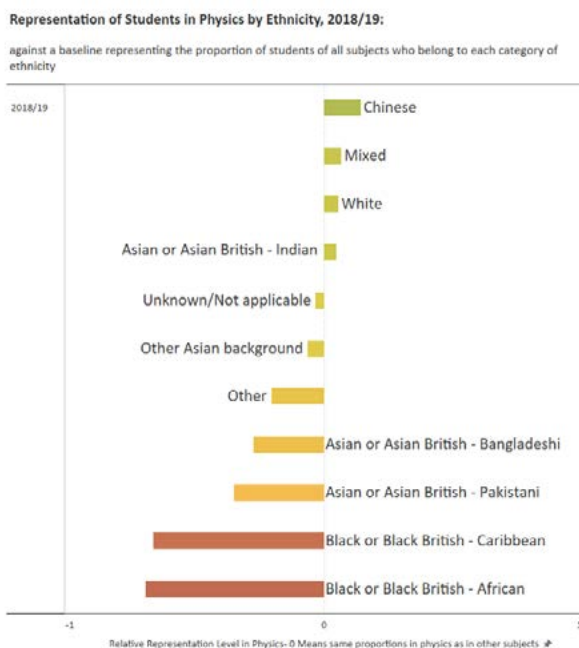


Figure 11: Representation level of Physics students by ethnicity

UK domiciled Asian or Asian British – Bangladeshi Students

Only 0.8% of UK-Domiciled Physics students are Bangladeshi, making them highly under-represented in Physics. Bangladeshi students are particularly under-represented in Physics compared with selected STEM subjects. Bangladeshi students represent 1.8% of students across the seven selected STEM subjects compared, against 1.5% of all students.

Of the Asian Ethnic groups compared, Bangladeshi and Pakistani students have the poorest representation levels in Physics.

The number of Bangladeshi Physics students has increased substantially, however, from ~40 in 2010/11 to ~140 in 2018/19; the only ethnic grouping to have seen three-fold growth over the period.

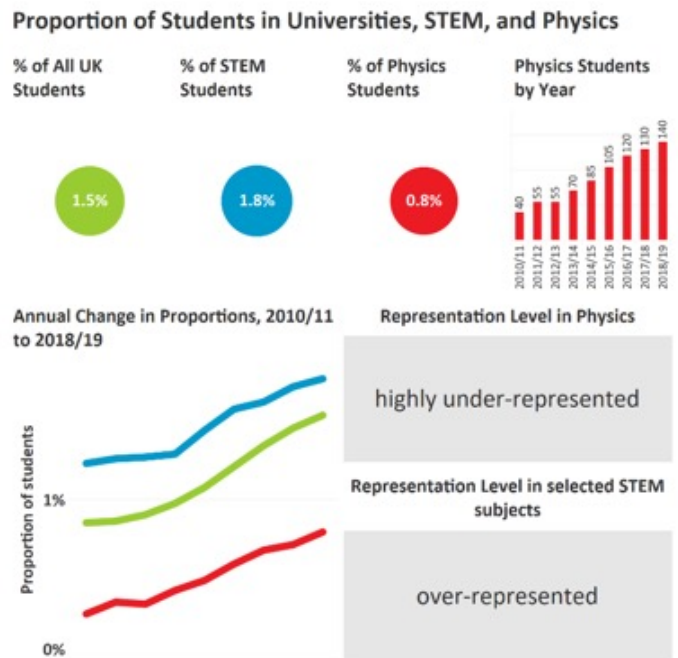


Figure 12: UK Domiciled Asian or Asian British - Bangladeshi representation Levels

2018/19: Number of Students and Proportion of each Subject's Students

Subject Group	Number of Students	% of Subject's Students
Physics	140	0.8%
Astronomy	10	0.6%
Biology	465	1.7%
Chemistry	335	1.8%
Computer sciences	1,705	2.1%
Electronic & electrical engineering	215	1.6%
Mathematics	520	1.7%

Student Number Trends, 2010/11 to 2018/19

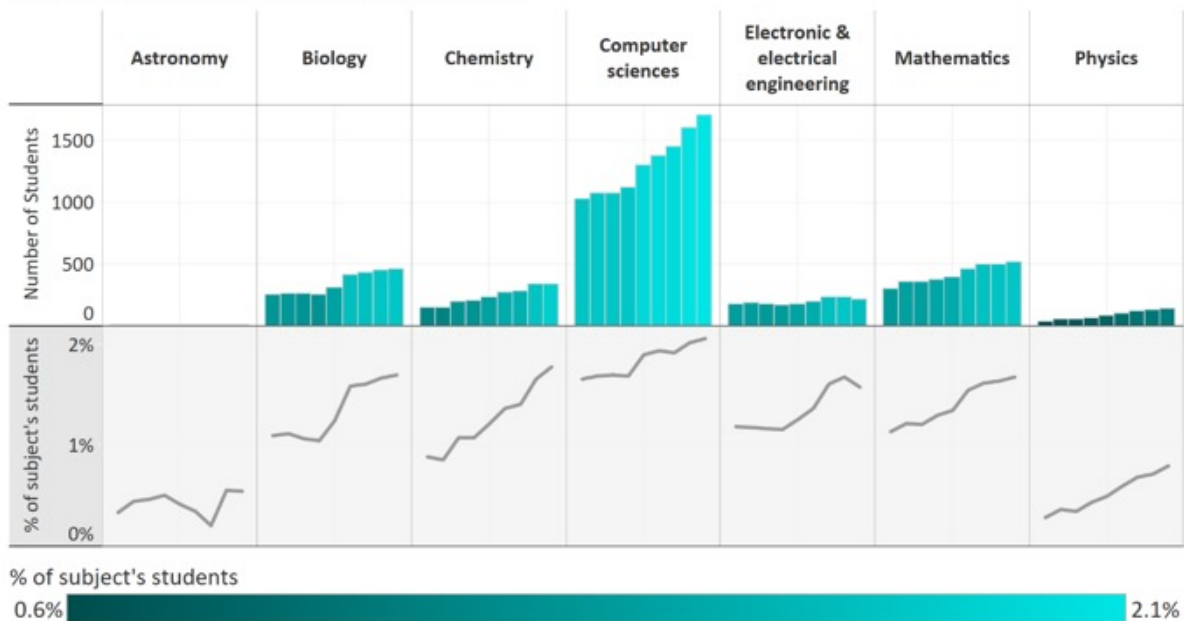


Figure 13: UK Domiciled Asian Or Asian British - Bangladeshi Students by Subject

UK domiciled Asian or Asian British – Indian Students

Indian students are well-represented in Physics; they make up a slightly higher proportion of Physics students (3.8%) than of the whole UK student population (3.5%). Indian students make up a still greater proportion of the selected STEM subjects (4.3%).

Of the other selected STEM subjects analysed, Indian students have the highest representation level in Mathematics (5.3%) and the lowest in Biology (3.0%).

Indian Physics student numbers have grown consistently and quickly, both in raw numbers (355 in 2010/11 to 670 in 2018/19) and compared with the group of other selected STEM subjects. Indian students are the third largest ethnic grouping among Physics students, after White and Mixed students.

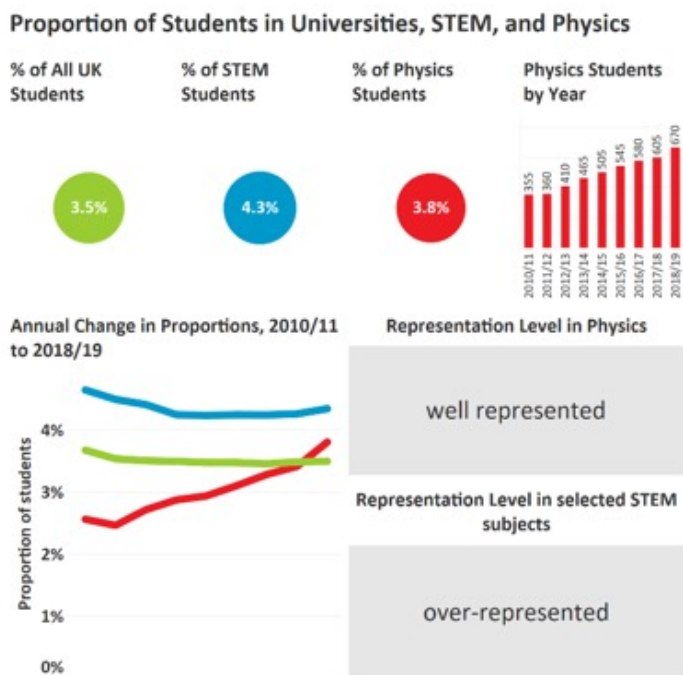


Figure 14: UK Domiciled Asian or Asian British - Indian Representation Levels

2018/19: Number of Students and Proportion of each Subject's Students

Subject Group	Number of Students	% of Subject's Students
Physics	670	3.8%
Astronomy	70	3.2%
Biology	810	3.0%
Chemistry	800	4.2%
Computer sciences	3,820	4.6%
Electronic & electrical engineering	595	4.4%
Mathematics	1,630	5.3%

Student Number Trends, 2010/11 to 2018/19

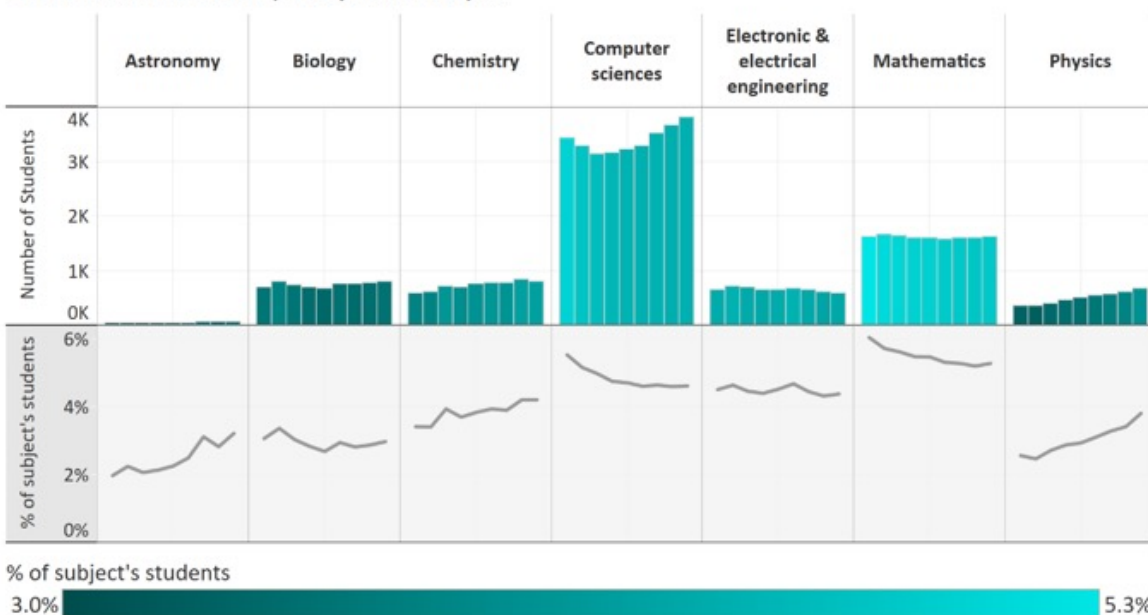


Figure 15: UK Domiciled Asian Or Asian British - Indian Students by Subject

UK domiciled Asian or Asian British – Pakistani Students

Pakistani students are highly under-represented in Physics; only 1.5% of UK domiciled Physics students are Pakistani. This is particularly stark given that Pakistani students represent 4.7% of computer science students, 4.3% of Electronic & Electrical Engineering students, 3.5% of Chemistry students, and 3.3% of Biology students.

While the number of Pakistani Physics students more than doubled between 2010/11 and 2018/19, the growth in representation levels in Physics has been similar to the growth in representation levels in other selected STEM subjects and across all subjects; much faster growth of Pakistani Physics students would be required to reach good representation levels.

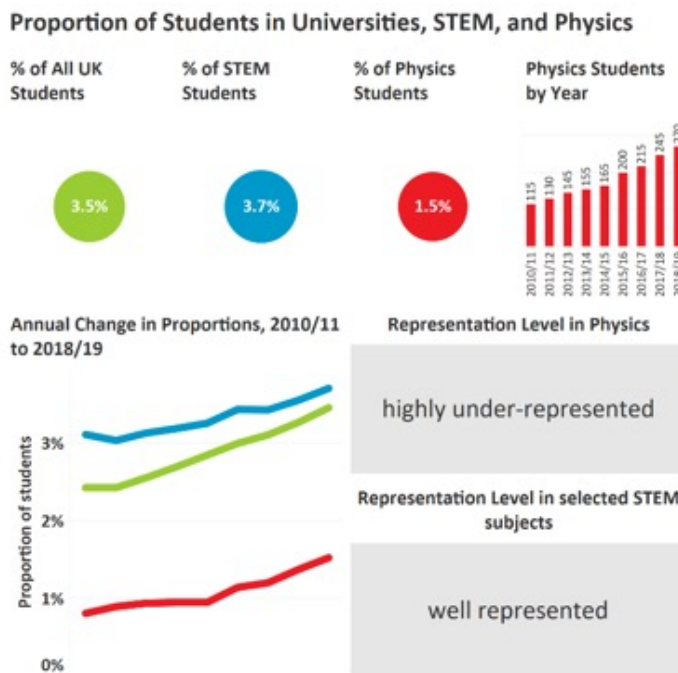


Figure 16: UK Domiciled Asian or Asian British - Pakistani Representation Levels

2018/19: Number of Students and Proportion of each Subject's Students

Subject Group	Number of Students	% of Subject's Students
Physics	270	1.5%
Astronomy	30	1.3%
Biology	900	3.3%
Chemistry	670	3.5%
Computer sciences	3,875	4.7%
Electronic & electrical engineering	580	4.3%
Mathematics	840	2.7%

Student Number Trends, 2010/11 to 2018/19

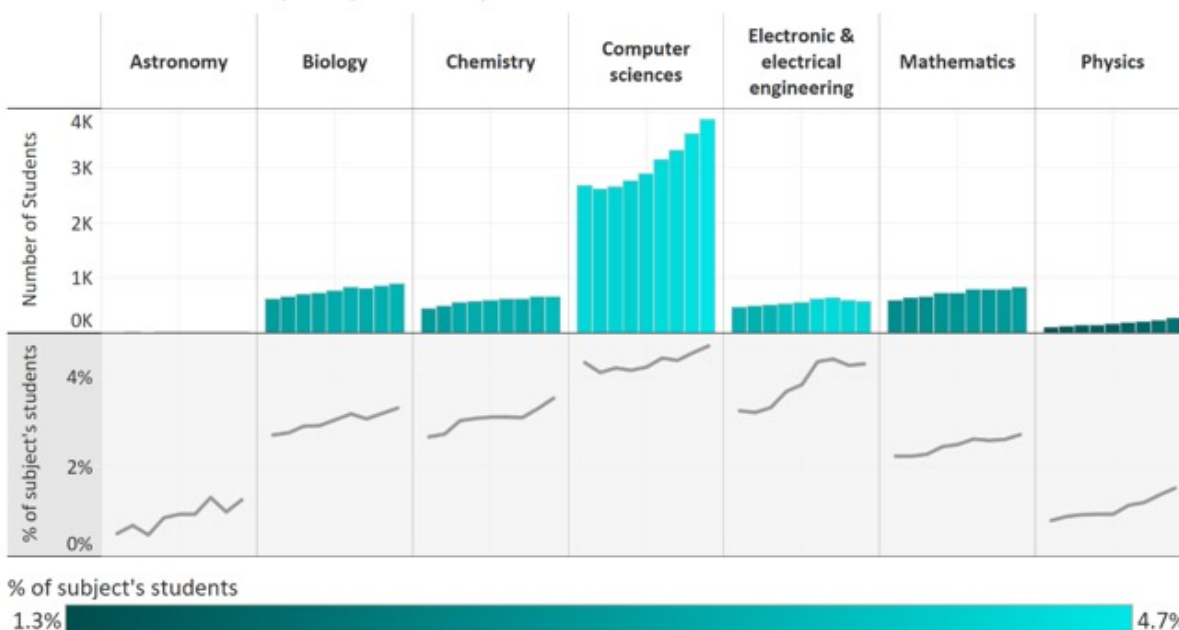


Figure 17: UK Domiciled Asian Or Asian British Pakistani Students by Subject

UK domiciled Chinese Students

UK domiciled Chinese students are over-represented in Physics and other selected STEM subjects, but the number of Chinese students and share of students who are Chinese reached a peak in 2015/16.

There were ~210 UK domiciled Chinese physics students in UK universities in 2018/19 (1.2% of Physics students), compared with ~650 Mathematics students (2.1% of Mathematics students) and ~1,120 Computer sciences students (1.8% of Computer sciences students).

The pattern seen in Physics of relatively slow growth in the number of Chinese students compared with students from other backgrounds is also seen in other selected STEM subjects; notably Mathematics, Chemistry, and Computer Sciences.

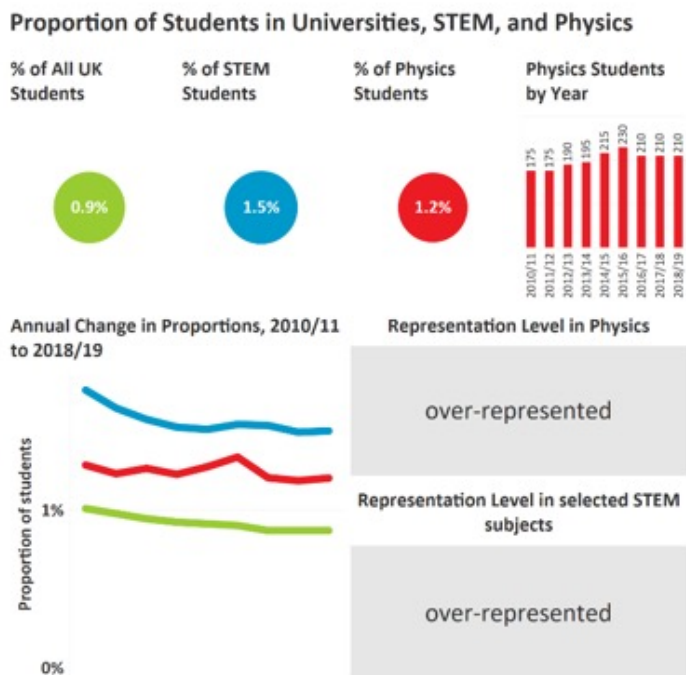


Figure 18: UK Domiciled Chinese Student Representation Levels

2018/19: Number of Students and Proportion of each Subject's Students

Subject Group	Number of Students	% of Subject's Students
Physics	210	1.2%
Astronomy	15	0.6%
Biology	240	0.9%
Chemistry	335	1.8%
Computer sciences	1,120	1.4%
Electronic & electrical engineering	270	2.0%
Mathematics	650	2.1%

Student Number Trends, 2010/11 to 2018/19

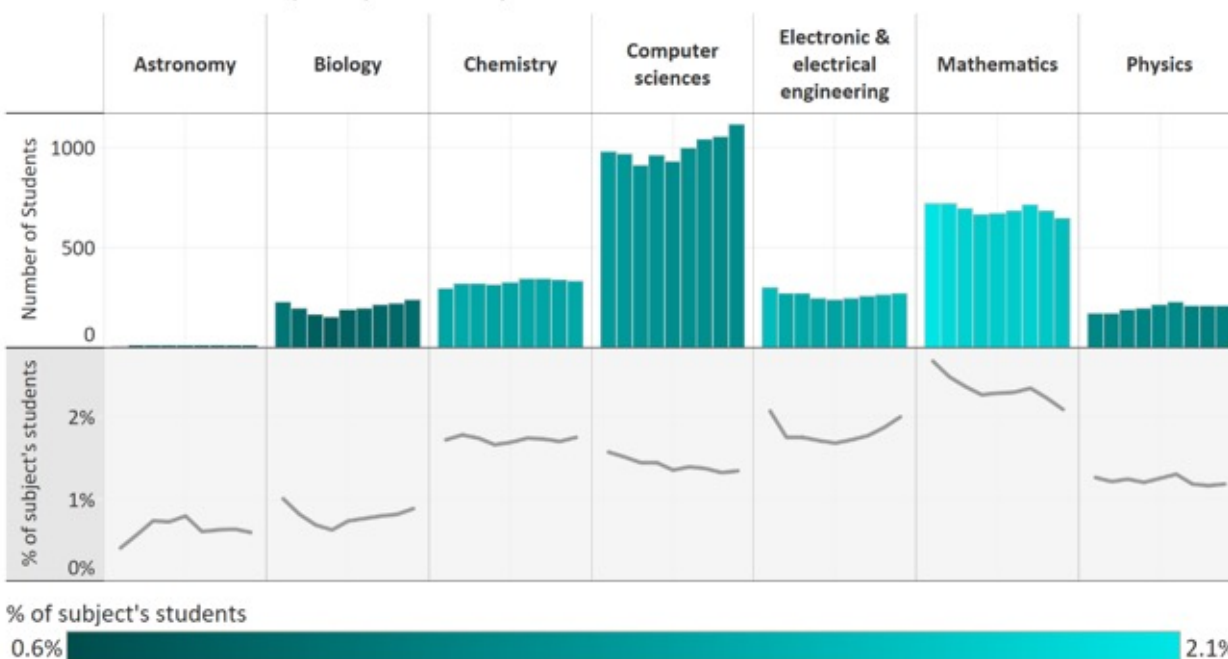


Figure 19: UK Domiciled Chinese Students by Subject

UK Domiciled Students from Other Asian Backgrounds

UK domiciled Students from Asian Backgrounds other than Bangladeshi, Indian, Pakistani, or Chinese are slightly under-represented in Physics, but as with all Asian students, they are better represented across selected STEM subjects than in Physics.

Students from Other Asian backgrounds made up 3.1% of Computer Science students in 2018/19, but only 1.9% of Physics students - the only one of the seven subjects compared with a smaller share was Astronomy.

The number of students from Other Asian backgrounds enrolled on Physics courses has grown quickly - from ~155 in 2010/11 to ~330 in 2018/19. This also represents a growing proportion of the Physics-student population; from just over 1% to just under 2%.

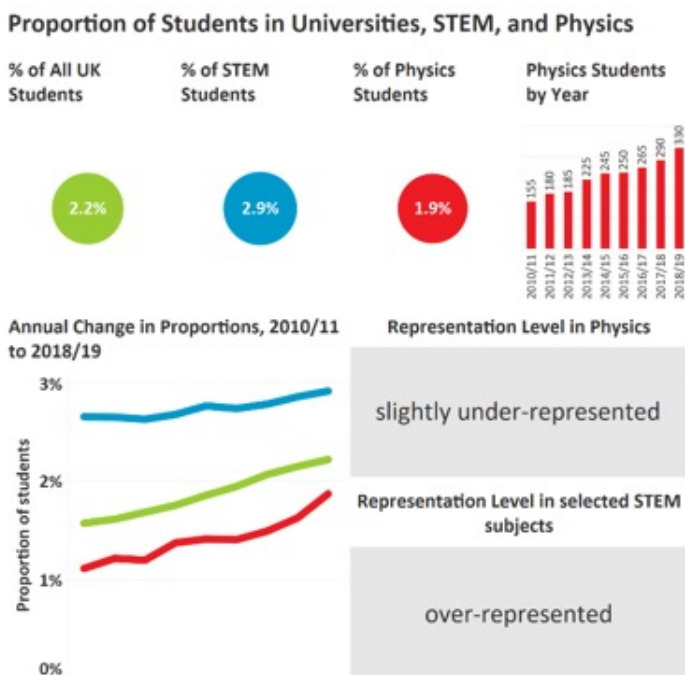


Figure 20: Representation Levels of UK domiciled Students from Other Asian Backgrounds

2018/19: Number of Students and Proportion of each Subject's Students

Subject Group	Number of Students	% of Subject's Students
Physics	330	1.9%
Astronomy	35	1.6%
Biology	795	2.9%
Chemistry	495	2.6%
Computer sciences	2,555	3.1%
Electronic & electrical engineering	475	3.5%
Mathematics	930	3.0%

Student Number Trends, 2010/11 to 2018/19

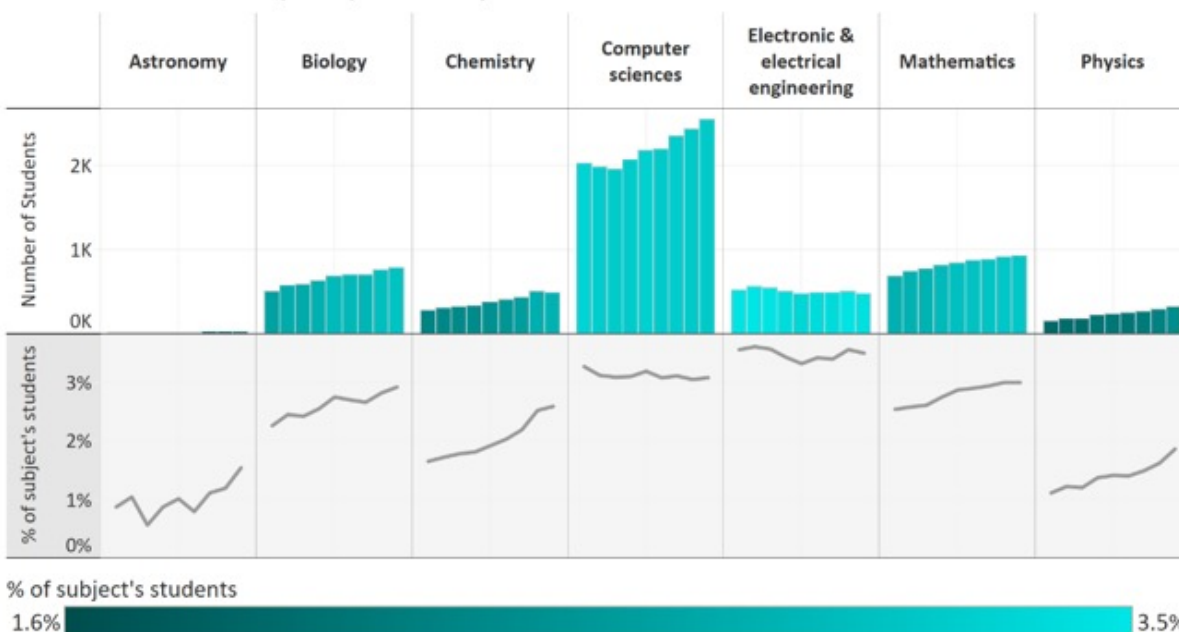


Figure 21: Students from Other Asian Backgrounds by Subject

UK Domiciled Black or Black British – African Students

UK domiciled Black African students are extremely under-represented in Physics, with only 1.1% of Physics students being Black African. By comparison 5.6% of all students are Black African, and 4.4% of students of seven selected STEM subjects are Black African

Black African students made up an increasing proportion of the overall UK Student population between 2010/11 and 2018/19, growing from a little over 4% to 5.6%, and are well represented in electronic and electrical engineering and computer sciences. While the number of Black African Physics students approximately doubled (to ~200) over the same period, much faster growth would have been required to close the representation gap significantly.

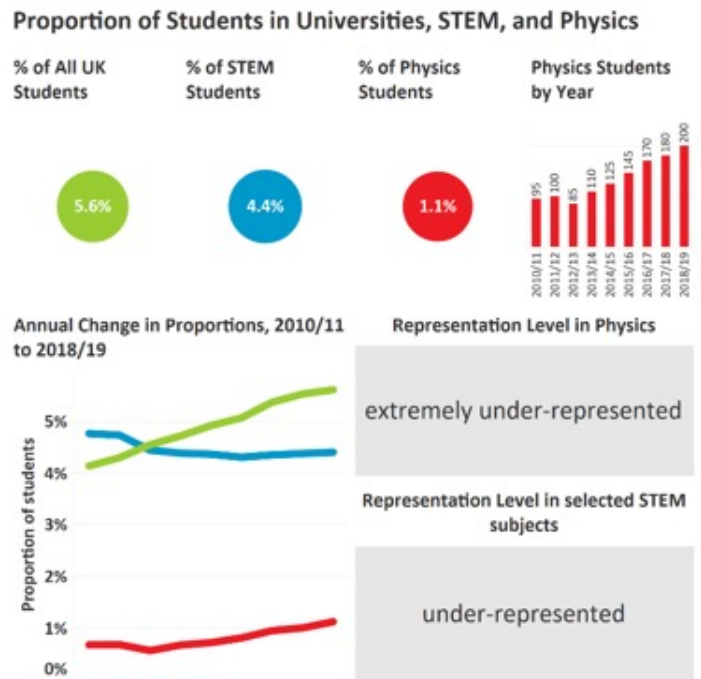


Figure 22: Black or Black British - African Representation Levels

2018/19: Number of Students and Proportion of each Subject's Students

Subject Group	Number of Students	% of Subject's Students
Physics	200	1.1%
Astronomy	15	0.8%
Biology	1,105	4.1%
Chemistry	680	3.6%
Computer sciences	4,740	5.7%
Electronic & electrical engineering	975	7.2%
Mathematics	790	2.6%

Student Number Trends, 2010/11 to 2018/19

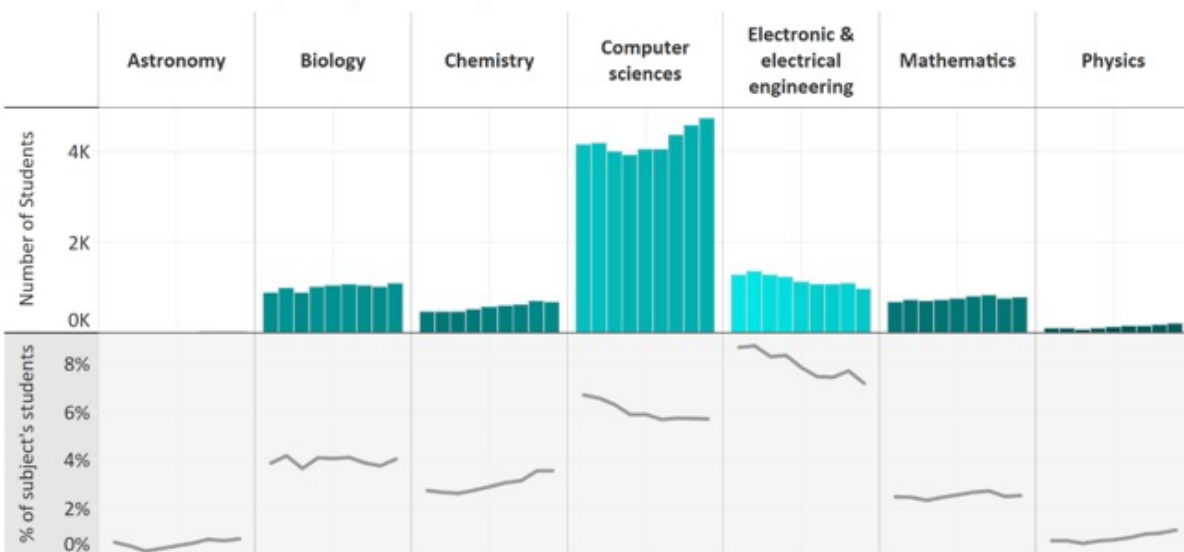


Figure 23: Black or Black British - African Students by Subject

UK Domiciled Black or Black British – Caribbean Students

Black Caribbean students are extremely under-represented in Physics- only 0.3% of Physics students are Black Caribbean.

While Black Caribbean students are also poorly represented in all selected STEM subjects, Physics and Astronomy are the subjects with the poorest representation levels (0.3% of students in both subjects).

The number of Black Caribbean physics students hasn't grown as quickly as the number of students from other backgrounds; in 2010/11 there were around the same number of Black Caribbean students as Bangladeshi Students, but in 2018/19 there were around twice as many Bangladeshi Students as Black Caribbean.

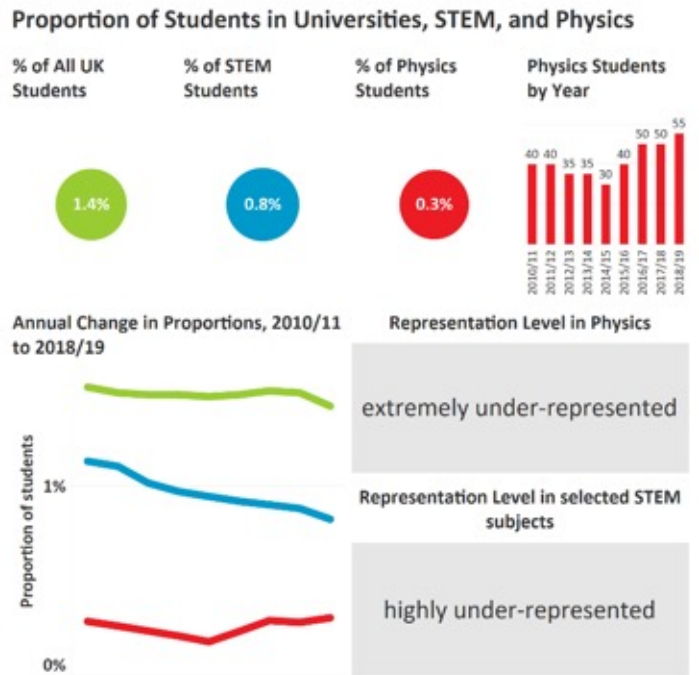


Figure 24: Black or Black British - Caribbean Students' Representation Levels

2018/19: Number of Students and Proportion of each Subject's Students

Subject Group	Number of Students	% of Subject's Students
Physics	55	0.3%
Astronomy	10	0.3%
Biology	185	0.7%
Chemistry	105	0.6%
Computer sciences	945	1.1%
Electronic & electrical engineering	110	0.8%
Mathematics	190	0.6%

Student Number Trends, 2010/11 to 2018/19

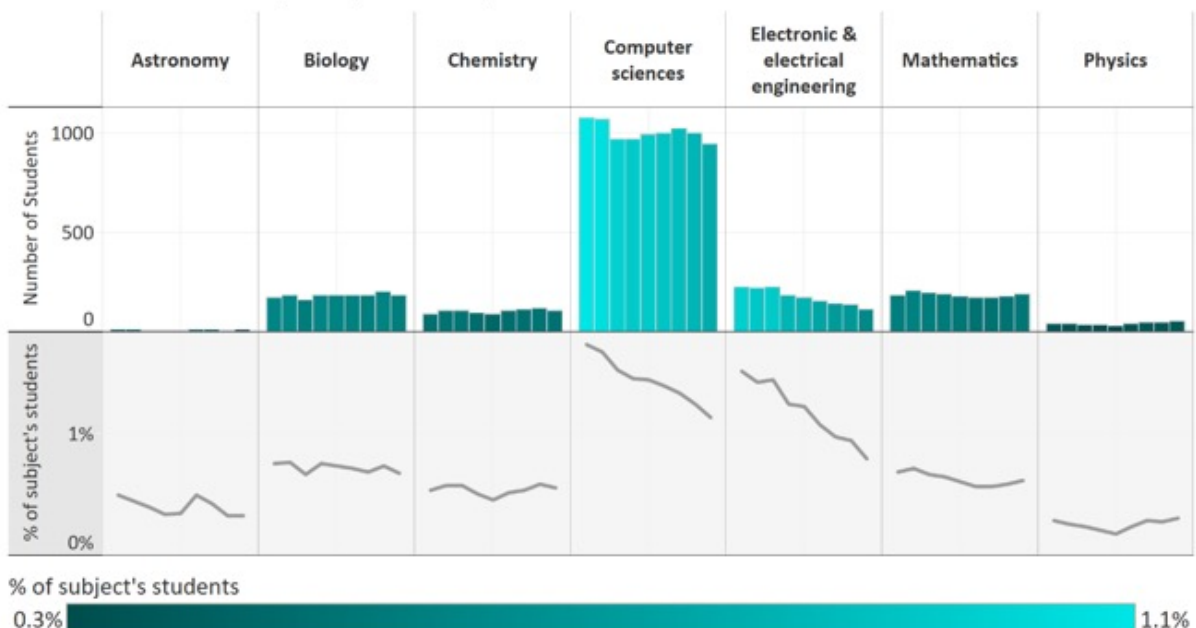


Figure 25: Black or Black British - Caribbean Students by Subject

UK Domiciled Students from Other Black Backgrounds

While the number of students recorded as being from Other Black Backgrounds makes up a relatively small proportion of UK Students, they remain extremely under-represented in Physics.

Only 0.1% of Physics students are from Other Black backgrounds, whereas a representative figure would be 0.4%. Students from Other Black Backgrounds are well represented in Electronic & Electrical Engineering and Computer Sciences, and far-worse represented in Physics and Astronomy (in particular), but also in Biology, Chemistry, and Mathematics.

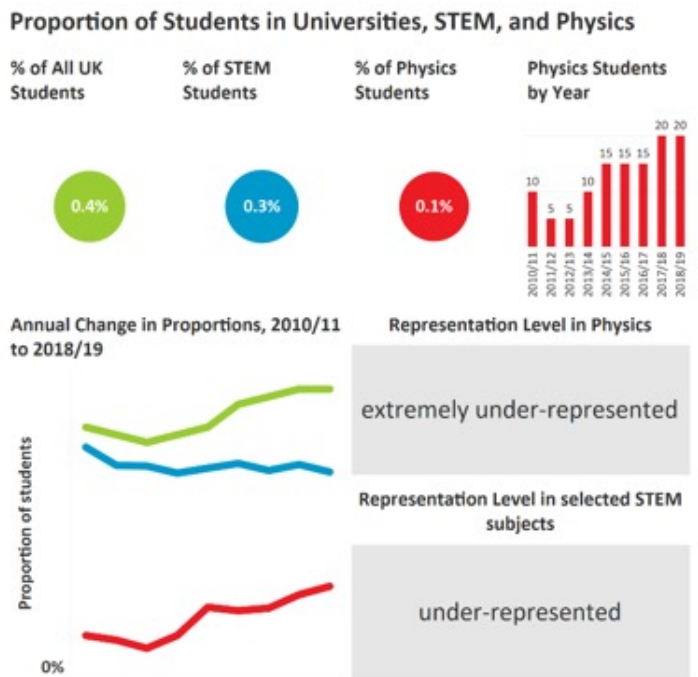


Figure 26: Students from other Black or Black British Backgrounds - Representation Levels

2018/19: Number of Students and Proportion of each Subject's Students

Subject Group	Number of Students	% of Subject's Students
Physics	20	0.1%
Astronomy	5	0.1%
Biology	60	0.2%
Chemistry	40	0.2%
Computer sciences	310	0.4%
Electronic & electrical engineering	40	0.3%
Mathematics	50	0.2%

Student Number Trends, 2010/11 to 2018/19

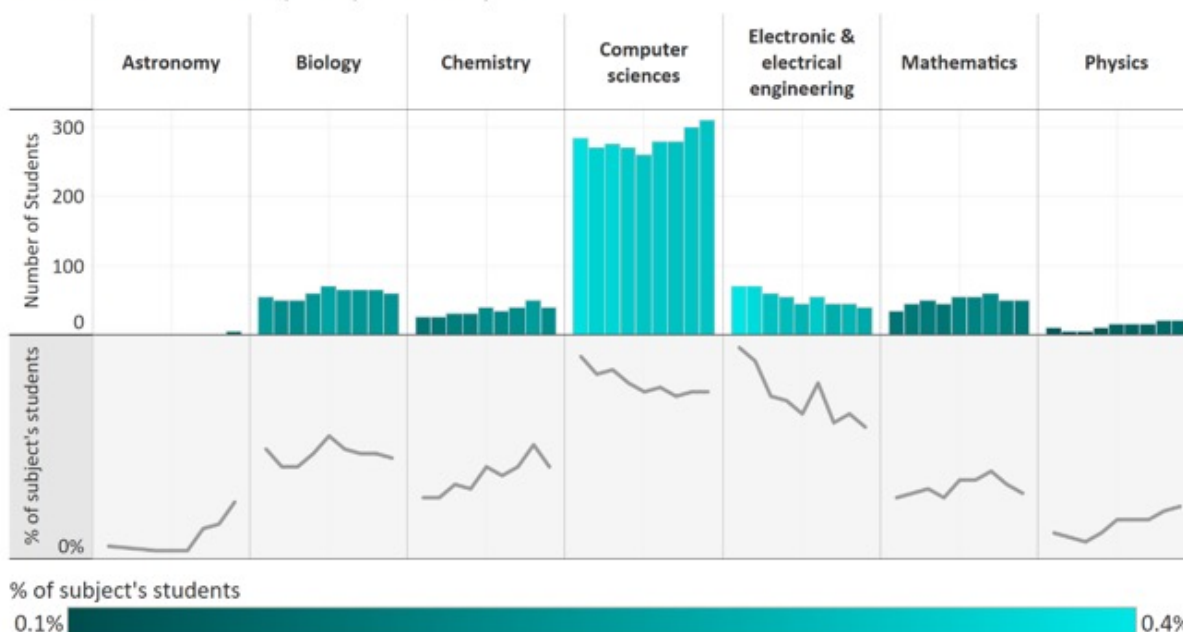


Figure 27: Students from other Black or Black British Backgrounds by Subject

UK Domiciled Mixed Ethnicity Students

Students with Mixed Ethnicities have high representation levels in Physics and selected STEM subjects. Unusually, the proportion of students enrolled on Physics courses and the proportion enrolled on comparable selected STEM courses are similar in both level and trend.

Mixed-ethnicity students have made up a growing proportion of all seven comparable selected STEM subjects since 2010/11, and the 855 Mixed Ethnicity Physics students in 2018/19 represented 4.9% of all Physics students in the UK- a higher figure than in the other six comparable selected STEM subjects analysed.

After White students, Mixed Ethnicity students are the second-largest ethnic grouping among Physics students.

Proportion of Students in Universities, STEM, and Physics

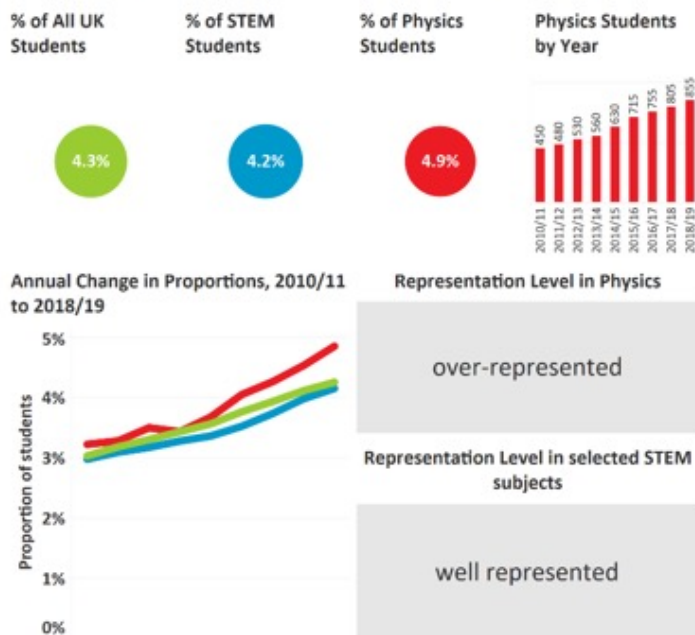


Figure 28: Mixed Ethnicity Students - Representation Levels

2018/19: Number of Students and Proportion of each Subject's Students

Subject Group	Number of Students	% of Subject's Students
Physics	855	4.9%
Astronomy	100	4.5%
Biology	1,240	4.6%
Chemistry	805	4.3%
Computer sciences	3,210	3.9%
Electronic & electrical engineering	530	3.9%
Mathematics	1,290	4.2%

Student Number Trends, 2010/11 to 2018/19

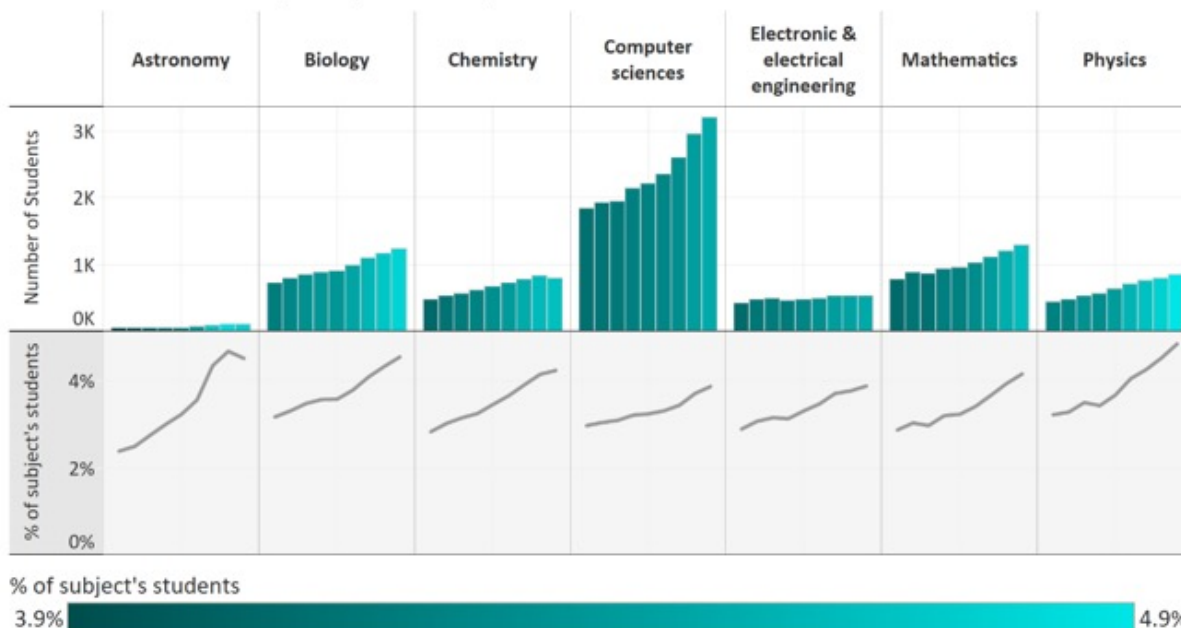


Figure 29: Mixed Ethnicity Students by Subject

UK Domiciled White Students

UK domiciled White students are well represented in Physics. White students made up 83.3% of UK domiciled Physics students in 2018/19 - among selected STEM subjects, White students only make up a larger proportion of the student population in Astronomy.

Both the number and proportion of Physics students who are White has been falling since 2015/16; there were around 500 fewer White Physics students in UK universities in 2018/19 than in 2015/16.

The only selected STEM subject analysed that saw substantial growth in the number of White students over the course of the period between 2010/11 and 2018/19 was Computer Sciences.

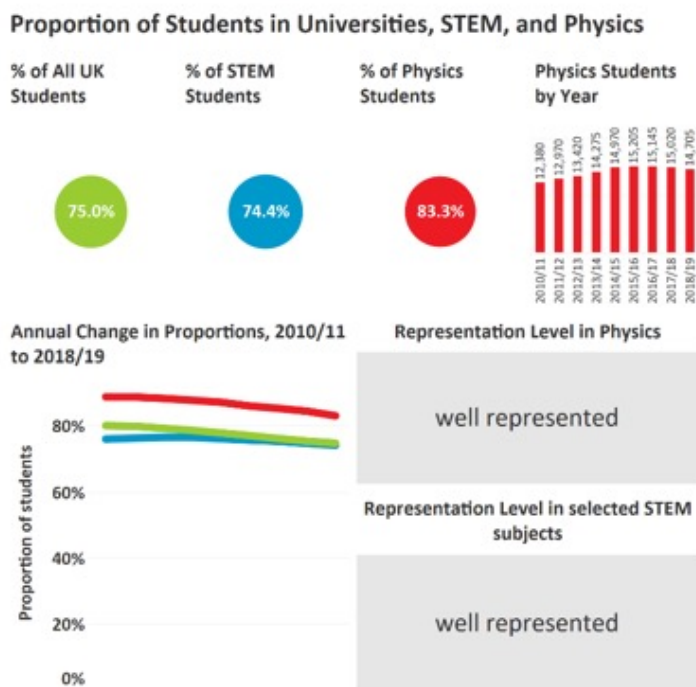


Figure 30: UK Domiciled White Students - Representation Levels

2018/19: Number of Students and Proportion of each Subject's Students

Subject Group	Number of Students	% of Subject's Students
Physics	14,705	83.3%
Astronomy	1,940	86.2%
Biology	20,950	77.1%
Chemistry	14,440	76.1%
Computer sciences	58,790	71.1%
Electronic & electrical engineering	9,365	69.1%
Mathematics	23,545	76.2%

Student Number Trends, 2010/11 to 2018/19

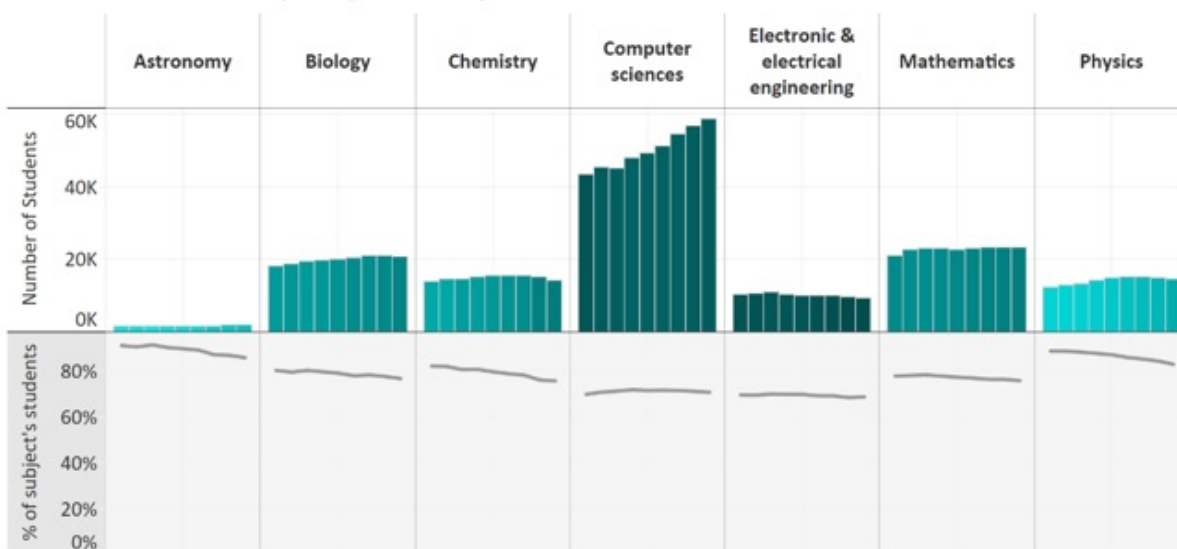


Figure 31: UK Domiciled White Students by Subject

All Other UK Domiciled Students

Students from Other ethnicities are highly under-represented in Physics; only ~185 (1.1%) of Physics students were from backgrounds not separately categorised in 2018/19, compared with 1.7% of students of other subjects.

This is not the case for our selected STEM subjects, with good representation seen in Electronic and Electrical Engineering, and reasonable representation in Computer Sciences. While this cohort of students are from a variety of different backgrounds, their overall pattern of representation in Physics is comparable to that of Pakistani & Black African students, with growing numbers of students in both Physics and other subjects, but the number of Physics students not growing quickly enough to close the representation gap.

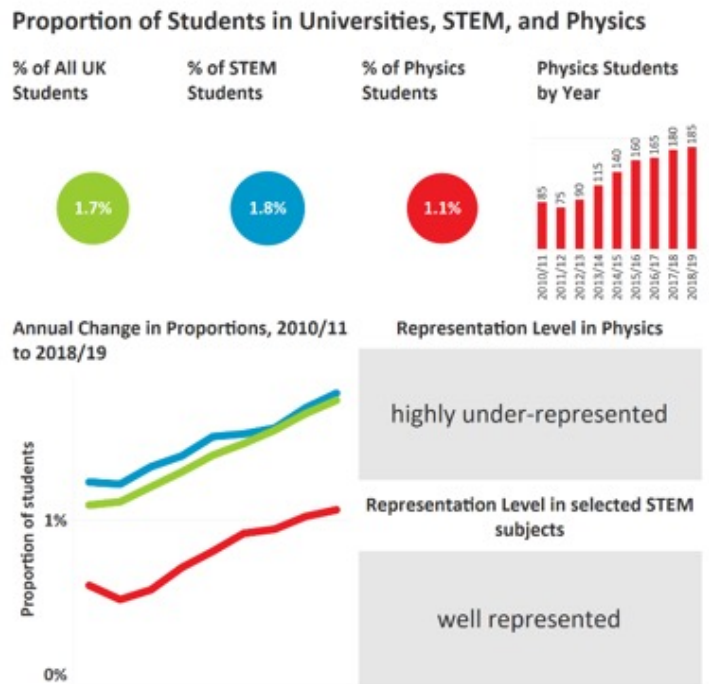


Figure 32: Representation Levels of UK Domiciled Students with Other Backgrounds

2018/19: Number of Students and Proportion of each Subject's Students

Subject Group	Number of Students	% of Subject's Students
Physics	185	1.1%
Astronomy	20	0.9%
Biology	425	1.6%
Chemistry	275	1.5%
Computer sciences	1,635	2.0%
Electronic & electrical engineering	405	3.0%
Mathematics	455	1.5%

Student Number Trends, 2010/11 to 2018/19

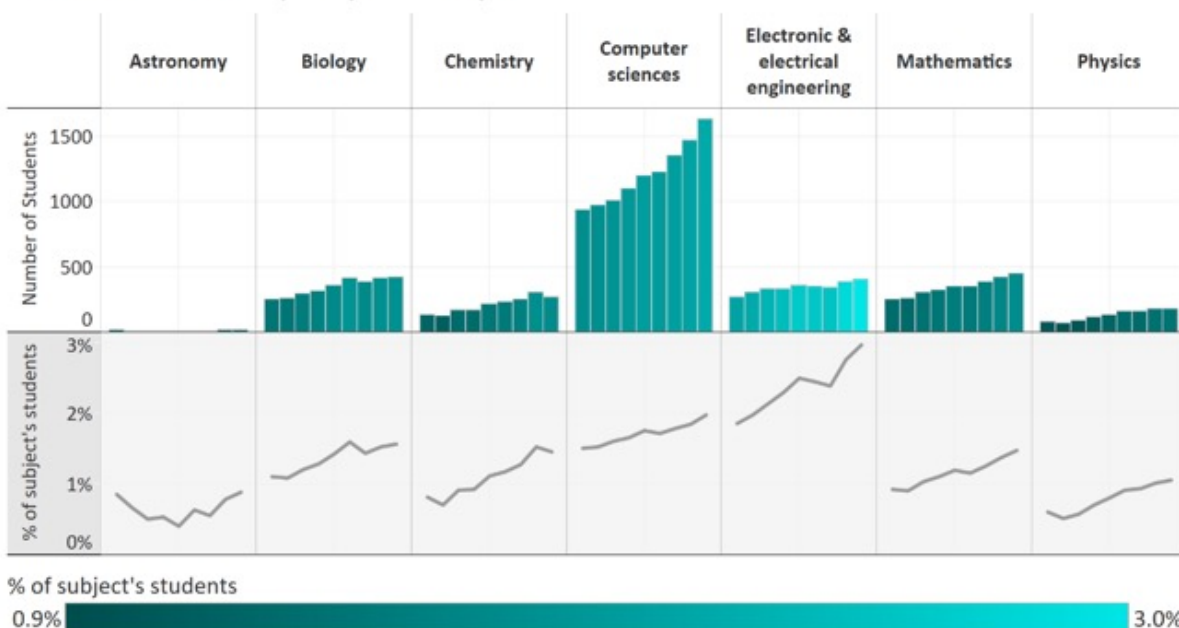


Figure 33: Students with Other Backgrounds, by Subject

Physics Undergraduates by Ethnicity

Figure 34 shows the ethnicity breakdown for Physics undergraduates in 2018/19. White Physics undergraduates make up the majority of the Physics undergraduate student population (83%).

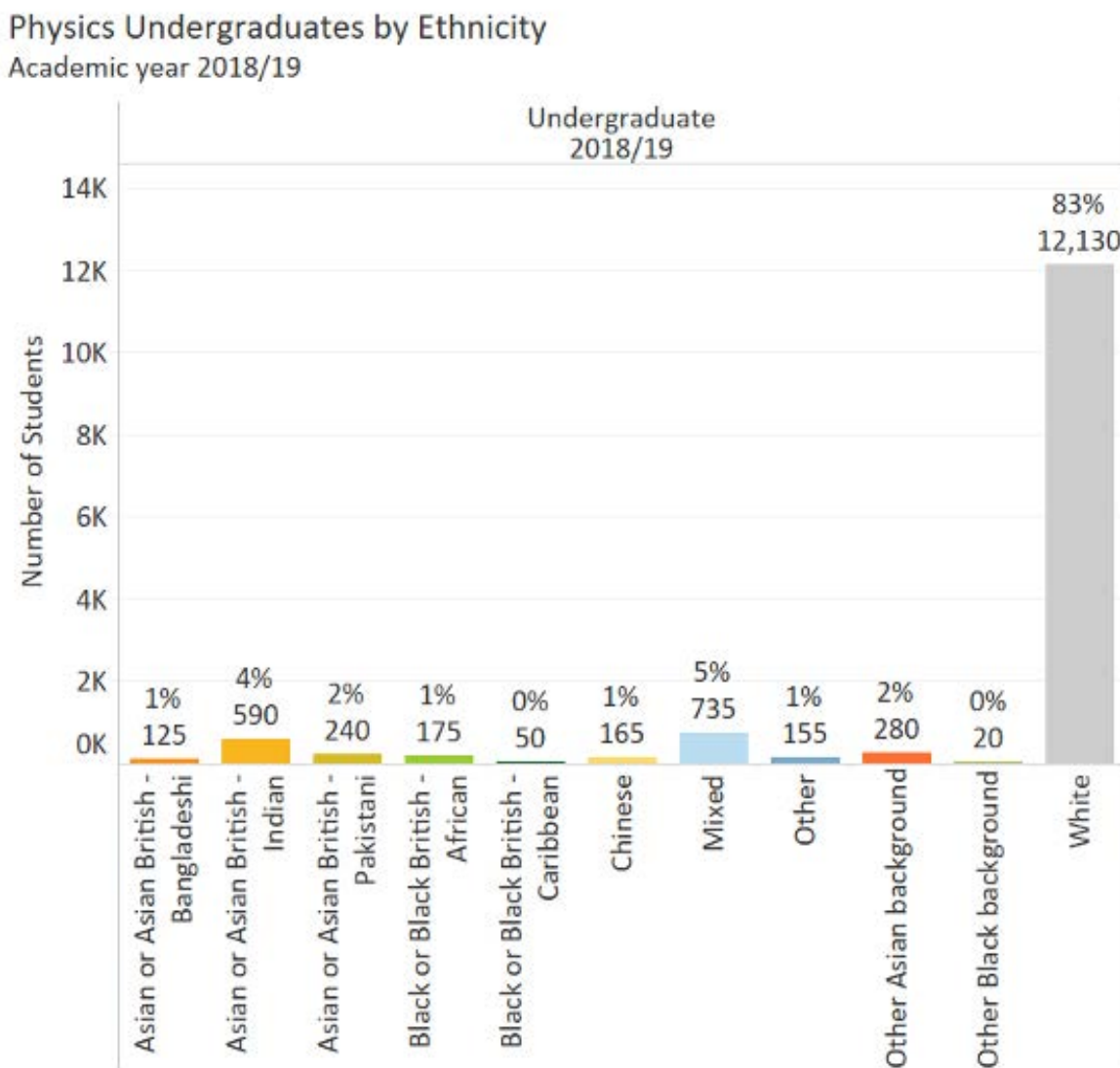


Figure 34: HESA data for Physics undergraduates by ethnicity for 2018/19.

Physics Postgraduates by Ethnicity

Assessing students who are engaged in postgraduate study highlights clear difference between ethnicities⁴.

Around 16% of White Physics students are postgraduates. However, despite overall growth in students from Asian Pakistani and Black African backgrounds, this has coincided with a sharp decrease in the proportion who are postgraduates.

In 2018/19, Chinese students were the ethnic group of Physics students most likely to be engaged in postgraduate studies (around 19%), and Black Caribbean Students the least likely (5%). Several ethnicities show steep drops in the proportion of students engaged in postgraduate studies, though in some cases the population sizes are low and sensitive to relatively small changes in numbers of students.

■ % Postgraduate (All)
 ■ % Postgraduate (STEM)
 ■ % Postgraduate (Physics)

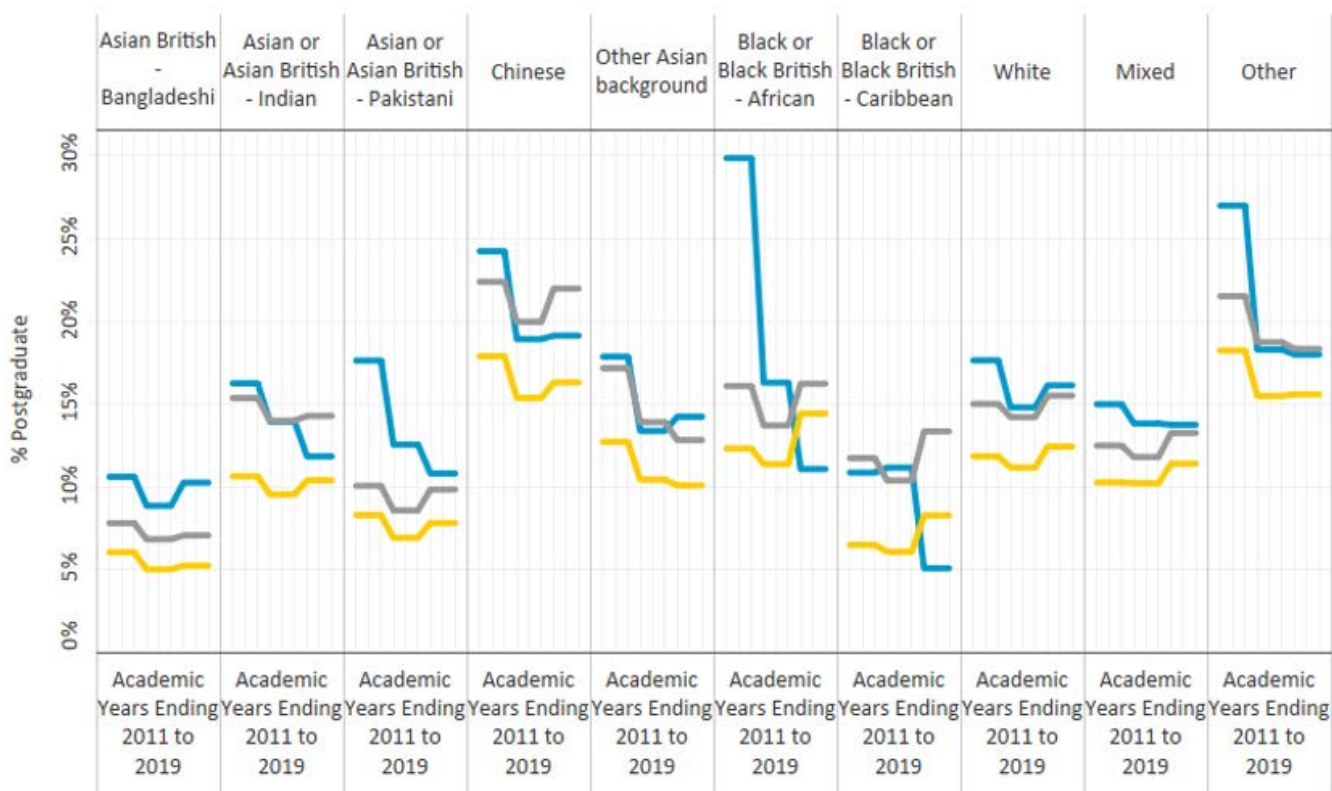


Figure 35: HESA data for postgraduate students by ethnicity for 2011 to 2019.

⁴ Table doesn't show figures for students recorded as having "Other Black Backgrounds" because the overall number of students in that group is too small to split while respecting anonymity conventions.

Ethnicity and Russell Group Enrolment

Broadly, students who are not from White backgrounds were as likely or more likely to attend Russell Group Universities to study Physics than White students.

Of the ethnic groups recorded, Mixed, Chinese, Indian, and Bangladeshi Physics students were the most likely to be enrolled at Russell Group universities. For each of these ethnic groups, 70% or more of Physics students across were enrolled at Russell Group universities (for all three-year periods checked). This is comparable with the large group of students where their ethnicity is not known or recorded – often overseas students – where 79% of Physics students were enrolled at Russell Group Universities.

Number of physics students				Proportion of Physics Students Attending Russell Group Universities		
Ethnicity	Physics Students 2011:13	Physics Students 2014:16	Physics Students 2017:19	2010/11, 2011/12, 2012/13	2013/14, 2014/15, 2015/16	2016/17, 2017/18, 2018/19
Asian or Asian British – Bangladeshi	145	265	390	70%	71%	72%
Asian or Asian British – Indian	1,130	1,520	1,860	73%	72%	3%
Asian or Asian British – Pakistani	385	520	725	68%	68%	64%
Chinese	540	645	630	80%	77%	79%
Other Asian background	520	715	885	71%	71%	70%
Black or Black British African	285	380	550	60%	57%	64%
Black or Black British – Caribbean	115	105	155	52%	37%	48%
Other Black background	20	40	55		62%	44%
White	38,770	44,450	44,875	67%	64%	63%
Mixed	1,460	1,905	2,415	74%	71%	74%
Other	250	415	535	70%	68%	69%
Unknown/Not applicable	9,825	11,165	13,210	74%	76%	79%

Table 11: Proportion of Physics Students Enrolled at Russell Group Universities by Ethnicity, split by three-year groups.

Around 63% of Physics students recorded as White attended Russell Group universities in between 2016/17 and 2018/19.

But Black Caribbean Physics students were consistently much less likely to attend Russell Group universities (48% during 2016/17, 2017/18 and 2018/19 combined) than White students. The proportions among Black African and Other Black students have fluctuated; over the academic years ending 2017 to 2019, 64% of Black African students were enrolled at Russell Group Universities (around the same proportion as among White Students), while in previous years the proportion had been much lower.

Ethnicity and Polar 5 Quintiles

Looking at Polar 5 quintiles gives an indication of the backgrounds of UK-Domiciled students who study Physics; while the data are not available for all students- notably students from Northern Ireland – a high proportion of students from the 5th Polar Quintile indicates that a larger proportion of students come from areas of the UK with high overall participation rates in higher education.

37% of White Physics students are from the quintile with the highest participation rates in higher education (Table 12), compared with 31% of White students across all subjects (Table 13) for 2016/17, 2017/18, 2018/19. Likewise, for all other ethnic groups except Black African, students attending university to study Physics are more likely to be from the 20% of Great Britain with the highest overall participation rates than their counterparts studying other subjects. Similarly, for all ethnicities except Black Caribbean, Physics students were less likely to be from the quintile with the lowest overall participation rates in higher education than non-Physics counterparts.

Indian Physics students have been the group most likely to come from 5th most advantaged areas, with 45% of Indian Physics students being from the top quintile. For all ethnicities except Chinese, there has been a gradual drop in the proportion of Physics students from the fifth quintile since 2010/11.

Ethnicity	% polar (physics)														
	2010/11, 2011/12, 2012/13					2013/14, 2014/15, 2015/16					2016/17, 2017/18, 2018/19				
	1st Polar Quintile- Lowest average access to HE	2nd Quintile	3rd Quintile	4th Quintile	5th Quintile: Highest Average access to HE	1st Polar Quintile- Lowest average access to HE	2nd Quintile	3rd Quintile	4th Quintile	5th Quintile: Highest Average access to HE	1st Polar Quintile- Lowest average access to HE	2nd Quintile	3rd Quintile	4th Quintile	5th Quintile: Highest Average access to HE
Asian or Asian British - Bangladeshi	2%	6%	29%	34%	29%	6%	9%	22%	39%	24%	3%	13%	19%	39%	26%
Asian or Asian British - Indian	4%	9%	15%	24%	47%	4%	9%	15%	25%	48%	5%	10%	15%	25%	45%
Asian or Asian British - Pakistani	4%	16%	19%	22%	40%	4%	15%	21%	21%	39%	7%	16%	18%	22%	36%
Chinese	10%	12%	15%	26%	34%	9%	13%	17%	23%	36%	11%	14%	17%	16%	40%
Other Asian background	6%	8%	16%	22%	47%	9%	10%	17%	21%	42%	12%	6%	16%	23%	42%
Black or Black British - African	10%	12%	22%	31%	24%	11%	13%	25%	33%	16%	13%	13%	25%	34%	15%
Black or Black British - Caribbean	4%	10%	13%	34%	39%	8%	8%	20%	31%	33%	12%	15%	12%	30%	31%
Other Black background						1%	28%	42%	28%	5%	5%	27%	29%	34%	
White	7%	13%	17%	22%	37%	8%	13%	17%	21%	37%	8%	13%	17%	21%	37%
Mixed	6%	10%	11%	26%	46%	6%	11%	14%	24%	44%	6%	11%	14%	24%	44%
Other	8%	14%	10%	21%	45%	5%	12%	13%	25%	43%	6%	10%	15%	28%	41%

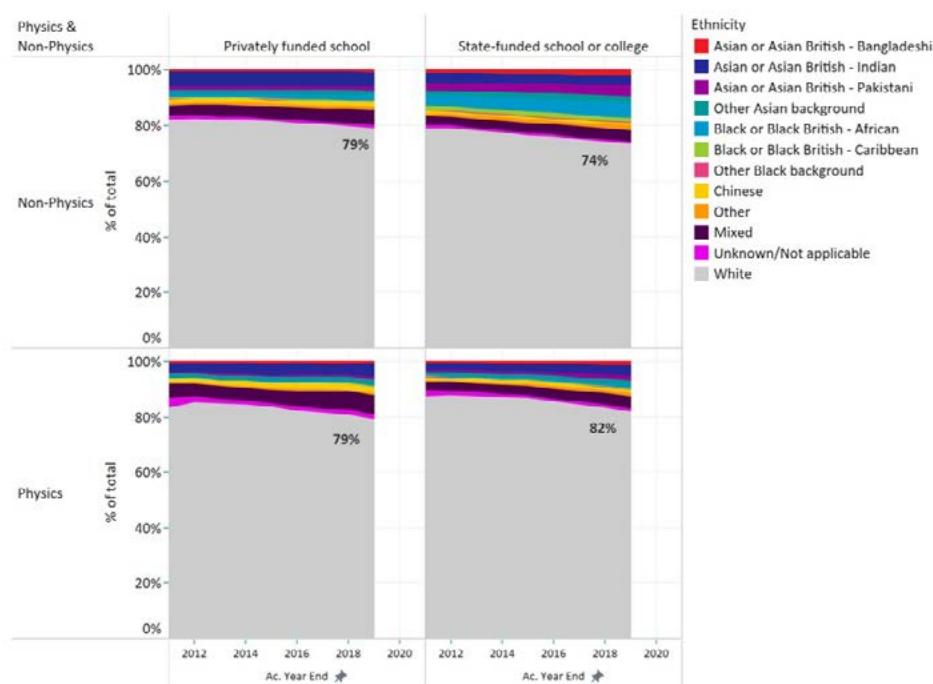
Table 12: Proportion Physics Students by Polar 5 Quintile, where known.

Ethnicity and State Schools

A challenge for Physics is in attracting Black and Minority Ethnic students from state schools. In 2018/19, Physics students from state-funded schools were slightly more likely to be White than their privately educated counterparts. By contrast, state-funded students in non-Physics subjects were much less likely to be White than privately educated non-Physics students.

So, while privately educated Physics and non-Physics students have a broadly similar breakdown by ethnic group, state-educated students appear much more likely to choose non-Physics subjects if from Black and Minority ethnic backgrounds.

Physics is unusual in that, at least among students where ethnicity is known, privately educated Physics students are less likely to be White than state-educated Physics students. For non-Physics students, the reverse is true; state-educated students are less likely to be from White backgrounds.



State School Marker	Ethnicity	2010/11		2014/15		2018/19	
		Physics	Non-Physics	Physics	Non-Physics	Physics	Non-Physics
Privately funded school	Asian or Asian British - Bangladeshi	0%	0%	1%	0%	0%	0%
	Asian or Asian British - Indian	3%	5%	4%	5%	5%	5%
	Asian or Asian British - Pakistani	1%	2%	0%	2%	1%	2%
	Other Asian background	1%	2%	2%	2%	2%	2%
	Black or Black British - African	0%	1%	1%	1%	1%	2%
	Black or Black British - Caribbean	0%	0%	0%	0%	0%	0%
	Other Black background		0%		0%	0%	0%
	Chinese	1%	2%	2%	1%	2%	2%
	Other	1%	1%	0%	1%	1%	1%
	Mixed	5%	4%	5%	4%	7%	5%
	Unknown/Not applicable	3%	2%	1%	1%	2%	1%
White	84%	82%	84%	82%	79%	79%	

Students from privately-funded schools by indicative years, subject, and ethnicity

State School Marker	Ethnicity	2010/11		2014/15		2018/19	
		Physics	Non-Physics	Physics	Non-Physics	Physics	Non-Physics
State-funded school or college	Asian or Asian British - Bangladeshi	0%	1%	0%	1%	1%	2%
	Asian or Asian British - Indian	2%	4%	3%	3%	4%	3%
	Asian or Asian British - Pakistani	1%	3%	1%	3%	2%	4%
	Other Asian background	1%	2%	2%	2%	2%	2%
	Black or Black British - African	1%	4%	1%	5%	1%	6%
	Black or Black British - Caribbean	0%	2%	0%	2%	0%	2%
	Other Black background	0%	0%	0%	0%	0%	0%
	Chinese	1%	1%	1%	1%	1%	1%
	Other	0%	1%	1%	1%	1%	1%
	Mixed	3%	3%	3%	4%	5%	4%
	Unknown/ Not applicable	2%	1%	1%	1%	1%	1%
White	88%	79%	87%	77%	82%	74%	

Students from state-funded schools by indicative years, subject, and ethnicity

Figure 36 Physics and Non-Physics Students and whether state-educated or privately educated. Only includes UK-domiciled students where ethnicity and education background are known, so the true picture may be different.

Ethnicity by HEP Region

Here ethnicity is broken down by HEP region. Physics and Astronomy are combined to respect anonymity conventions. Figure 37 shows the ethnicity breakdown for England. White Physics and Astronomy students make up 82% of the student population for Physics and Astronomy. Students who identify as Mixed represent 5% of the Physics and Astronomy student population and is the group with the second greatest student numbers. Other Black background represents the ethnic group with the fewest Physics and Astronomy students (25) and represents less than 0.5% of the total number of Physics and Astronomy students.

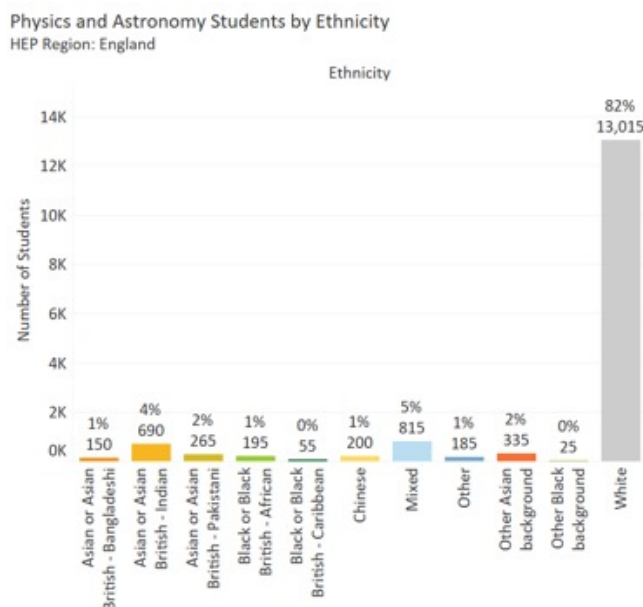


Figure 37: HESA data for Physics and Astronomy students by ethnicity in 2018/19.

The proportion of Physics and Astronomy students who are White is 92% in Scottish institutions. This proportion is greater than was seen for English institutions. Asian or Asian British – Bangladeshi and Black or Black British Caribbean are the ethnic groups with the fewest Physics and Astronomy students with fewer than 5 students in each category.

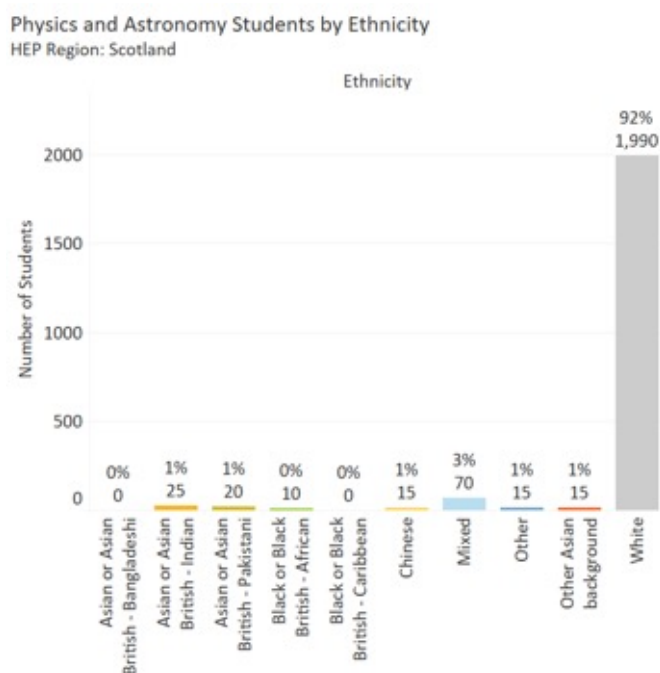


Figure 38: HESA data for Physics and Astronomy students by ethnicity in 2018/19.

For Welsh institutions, Other Black background is the ethnic group with the fewest number of Physics and Astronomy students in (<5). The total number of Physics and Astronomy students studying in Wales is far less than Scotland or England.

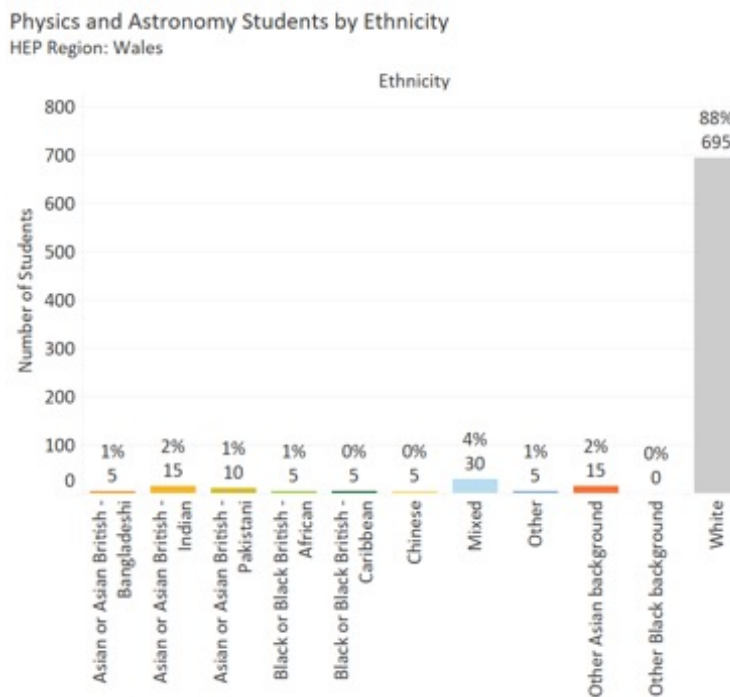


Figure 39: HESA data for Physics and Astronomy students by ethnicity in 2018/19.

With the fewest total number of Physics and Astronomy students, Northern Ireland has the highest proportion of White Physics and Astronomy students (95%). There is also less ethnic diversity amongst the students.

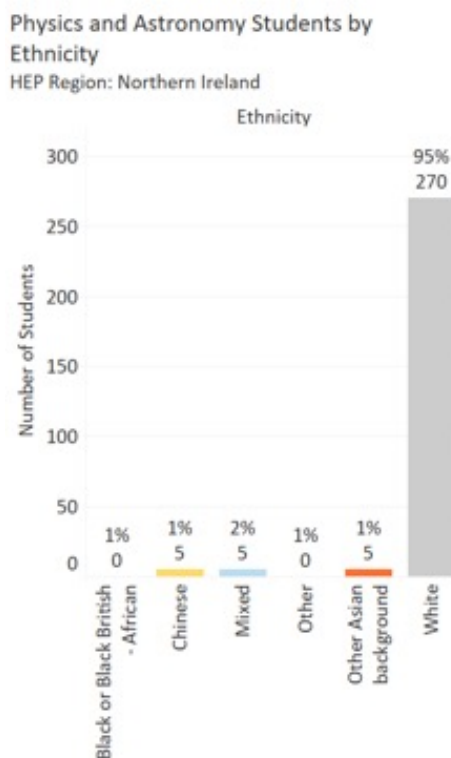


Figure 40: HESA data for Physics and Astronomy students by ethnicity in 2018/19.

Students by Disability

Below, **Figure 41** shows the total number of Physics students by disability. The most notable change is in the number of students disclosing a mental health condition. In 2010/11, the number of Physics students reporting a mental health condition was 125, by 2018/19, this figure had risen to 910. This represents a 628% increase and students reporting a mental health condition now represent 4% of Physics students (see **Figure 42**).

Though the number of students disclosing mental health conditions has increased dramatically, there are still a greater number of students reporting specific learning difficulties (1,055 students) in 2018/19. Overall, the proportion of Physics students with a disability has increased from 9% in 2010/11 to 15% in 2018/19 (**Figure 42**). This graph is represented as a table in **Table 14**.

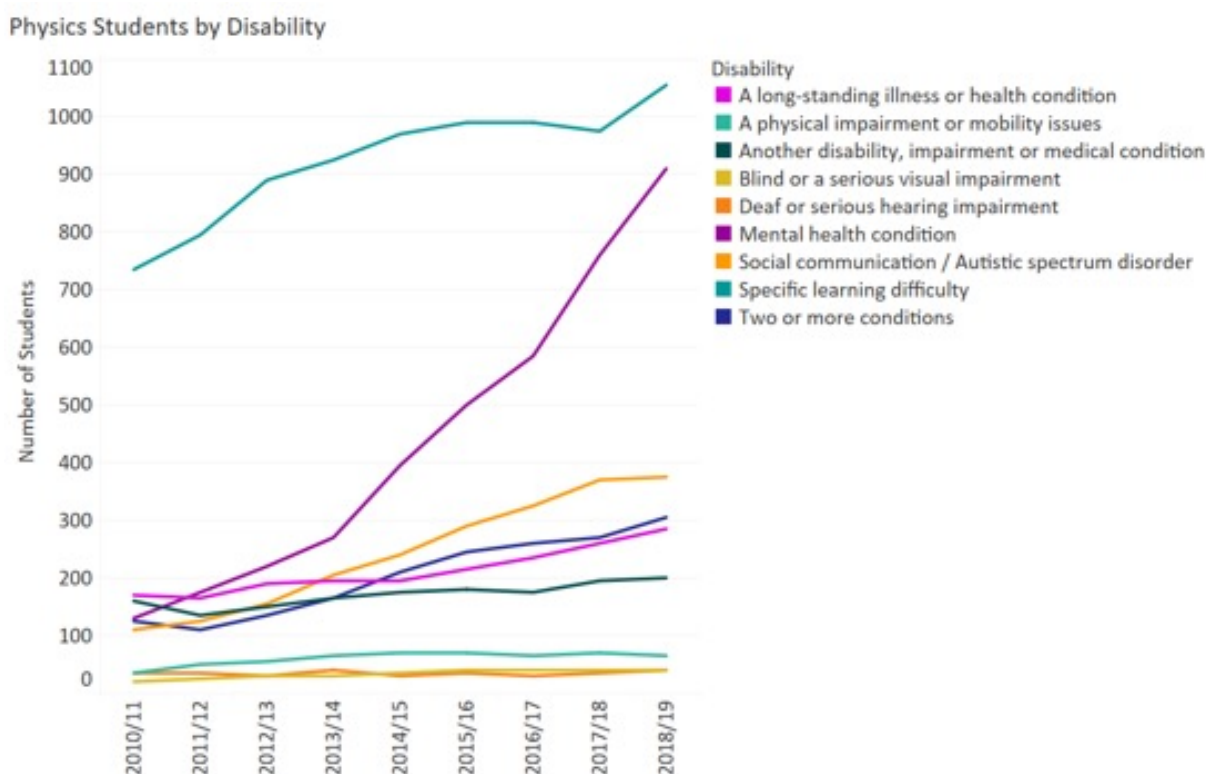


Figure 41: HESA data for Physics students by disability for academic years 2010/11 to 2018/19.

Disability	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
A long-standing illness or health condition	170	165	190	195	195	215	235	260	285
A physical impairment or mobility issues	35	50	55	65	70	70	65	70	65
Another disability, impairment or medical condition	160	135	150	165	175	180	175	195	200
Blind or a serious visual impairment	20	25	30	30	35	40	40	40	40
Deaf or serious hearing impairment	35	35	30	40	30	35	30	35	40
Mental health condition	130	175	220	270	395	500	585	760	910
Social communication / Autistic spectrum disorder	110	125	155	205	240	290	325	370	375
Specific learning difficulty	735	795	890	925	970	990	990	975	1,055
Two or more conditions	125	110	135	165	210	245	260	270	305
No known disability	15,655	16,195	16,610	17,710	18,515	18,955	19,145	19,075	19,115

Table 15: HESA data for Physics students by disability for academic years 2010/11 to 2018/19.

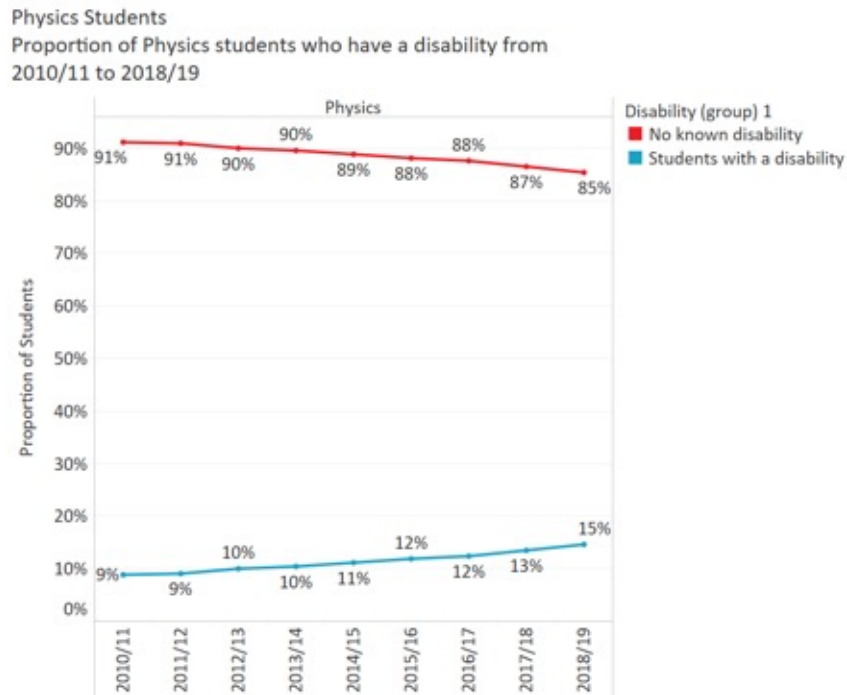


Figure 42: HESA data for proportion of Physics students with a disability from 2010/11 to 2018/19.

Figure 43 shows the proportion of students for selected STEM subjects that report having different disabilities. The sharp increase in students reporting mental health conditions shown in Figure 42 is seen in all other selected STEM subjects.

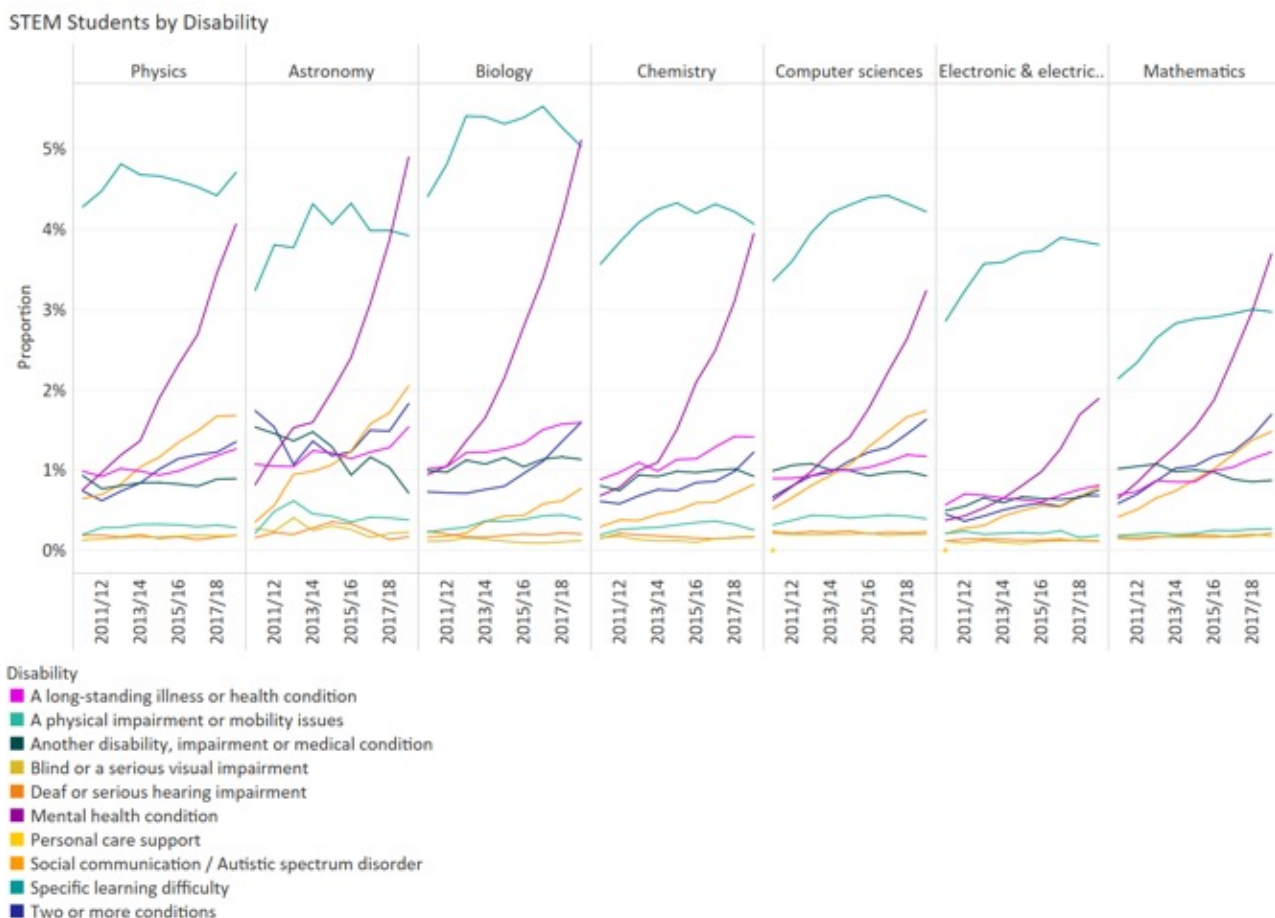


Figure 43: HESA data for STEM students by disability for academic years 2010/11 to 2018/19

STEM Students by Disability
Breakdown of STEM students in 2018/19

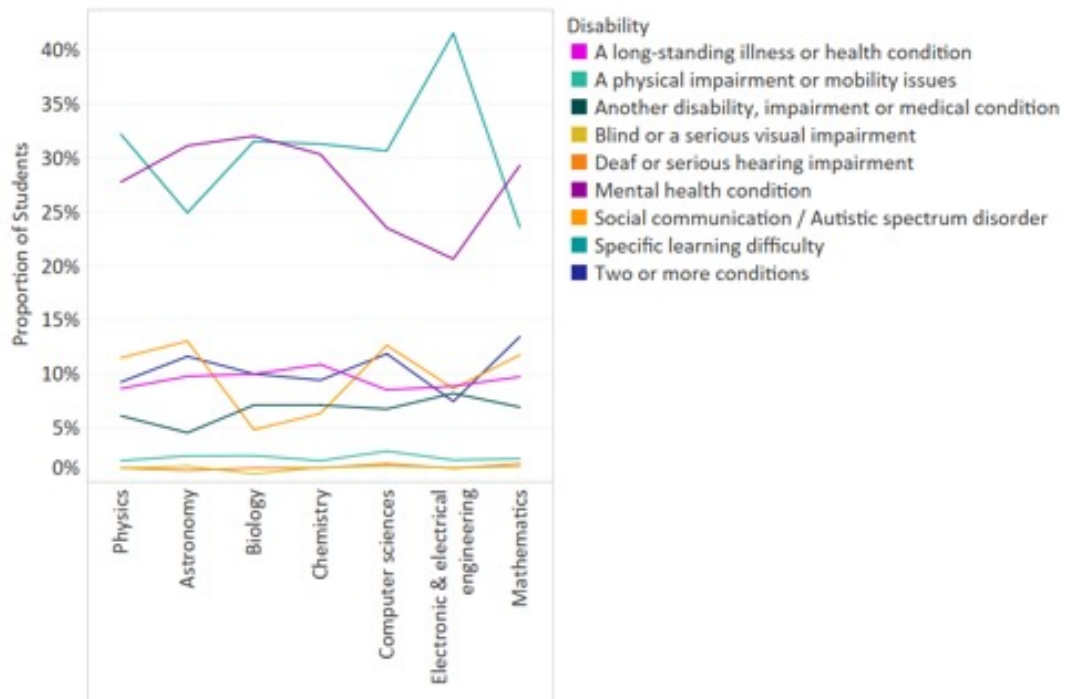


Figure 44: HESA data for selected STEM students who report having a disability by disability for 2018/19.

The below figure shows that a physical impairment or mobility issue and mental health conditions are the disabilities with the greatest proportion across selected STEM subjects. In 2018/19, Physics, Astronomy, Biology and Chemistry show the greatest proportion of students who have a disability, who report having a mental health condition, whereas Electronic & electrical engineering show the lowest proportion.

Physics and Computer Sciences has the highest proportion of social communication/autistic spectrum disorder (13%). For both subjects, this is the third most common disability by proportion of students who have a disability.

Disability by Physics Undergraduates

The number of Physics undergraduate students who have declared themselves as having a mental health condition has increased from 115 in 2011/12 to 785 in 2018/19: this is an increase of 583%. This increase is lower than the increase seen in Physics students as a whole, suggesting that a greater increase in postgraduates Physics students reporting mental health conditions.

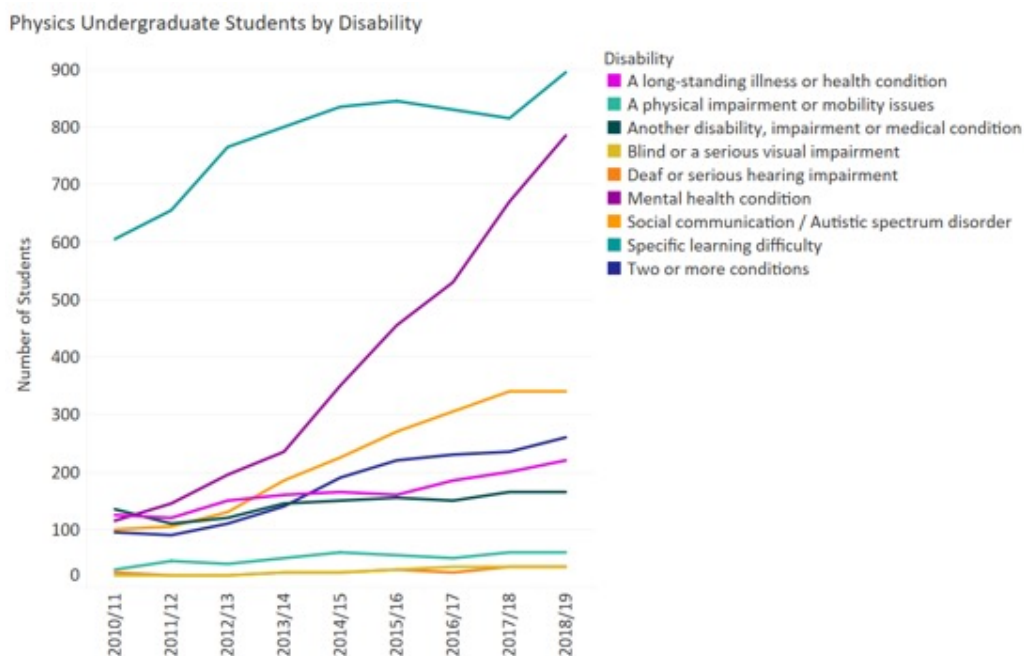


Figure 45: HESA data for Physics undergraduates by disability for 2011/12 to 2018/19.

Figure 46 shows that 6% of Physics undergraduate students have reported a specific learning disability. Physics undergraduates disclosing a mental health condition make up 5% of the Physics undergraduate population. In total, 83% of Physics undergraduate students report having no known disability.

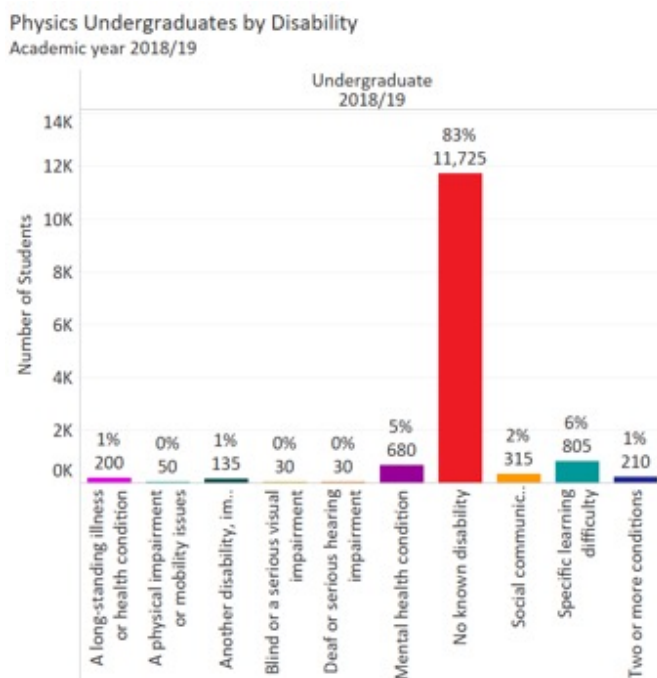


Figure 46: HESA data for Physics undergraduate students by disability for 2018/19.

Disability by Physics Postgraduates

Physics postgraduates reporting specific learning difficulty represent 5% of Physics postgraduate students and is the disability that represents the highest proportion of Physics postgraduates. Specific learning difficulty was also the disability with the highest proportion of Physics undergraduates in. Mental health condition is the disability with the second highest proportion of Physics postgraduates (4%).

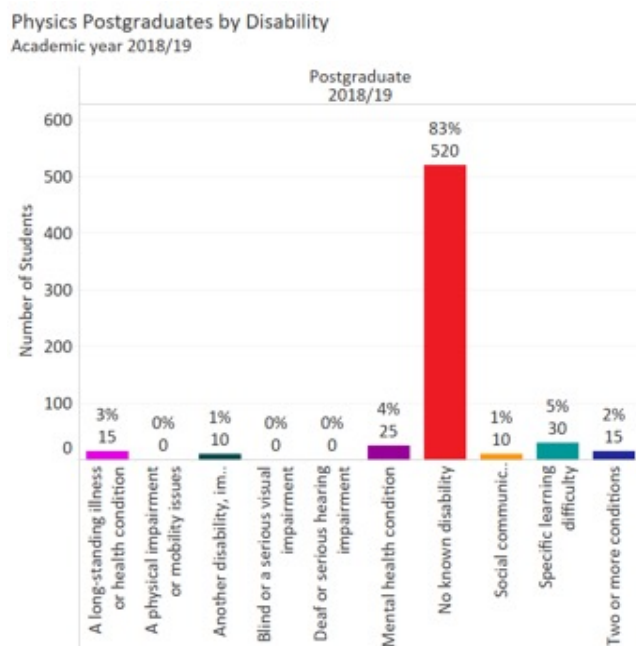


Figure 47: HESA data for Physics postgraduates by disability for 2018/19.

Disability by HEP Region

Figure 48 shows that mental health conditions (5%) and specific learning difficulty (5%) are two disabilities that represent the highest proportion of Physics and Astronomy students in England. There are more students reporting a specific learning difficulty (830) than those disclosing a mental health condition (770).

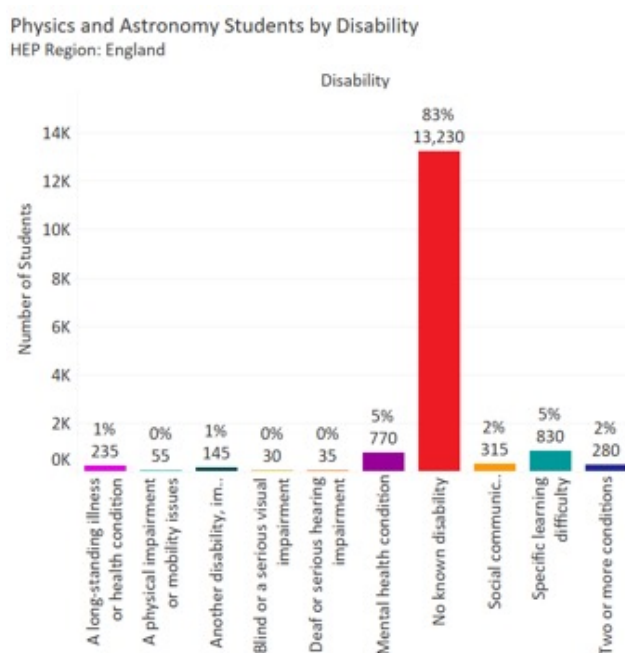


Figure 48: HESA data for Physics and Astronomy students by disability for 2018/19.

Figure 49 shows the disability breakdown for Physics and Astronomy students at Scottish institutions. 6% of Physics and Astronomy students in Scotland report a specific learning difficulty and 4% report having a mental health condition.

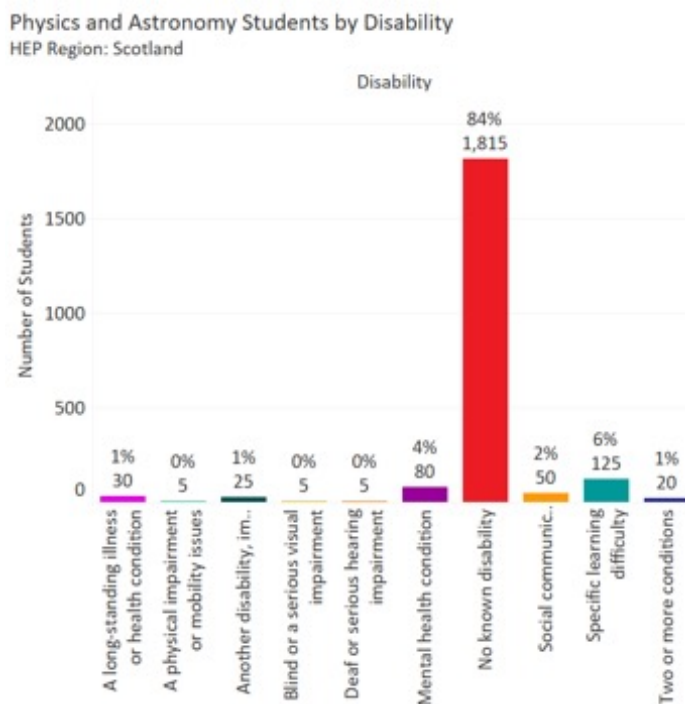


Figure 49: HESA data for Physics and Astronomy students by disability for 2018/19.

For Wales, 8% of Physics and Astronomy students report a specific learning difficulty and 3% report a mental health condition.

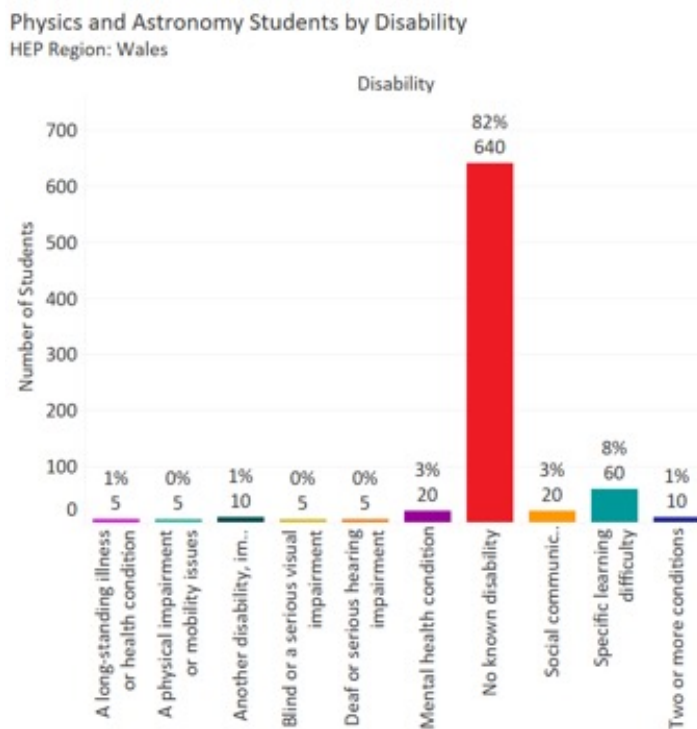


Figure 50: HESA data for Physics and Astronomy students by disability for 2018/19.

For Northern Irish institutions, 6% of students report a mental health condition. Physics and Astronomy students reporting a specific learning difficulty make up 4% of the Physics and Astronomy student population in Northern Ireland.

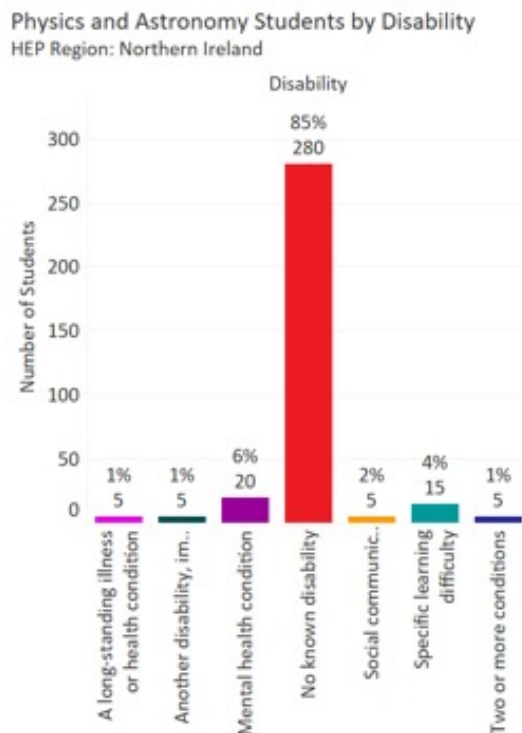


Figure 51: HESA data for Physics and Astronomy students by disability for 2018/19.

Students by Socio-Economic Background

Students come from a variety of backgrounds. Figure 52 shows how the number of Physics students from different socio-economic backgrounds have varied since 2010/11. Students with family members in lower managerial & professional occupations, small employers, own account workers or not classified, study Physics in greater numbers than those from other socio-economic backgrounds.

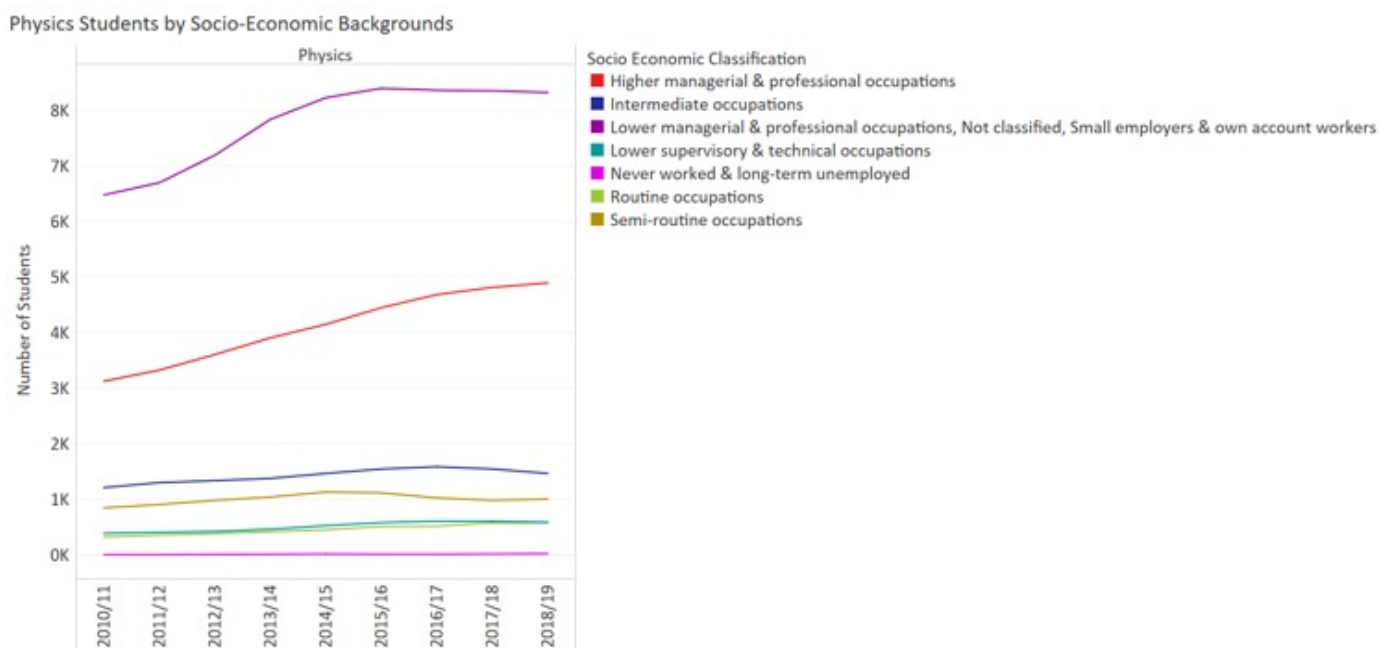
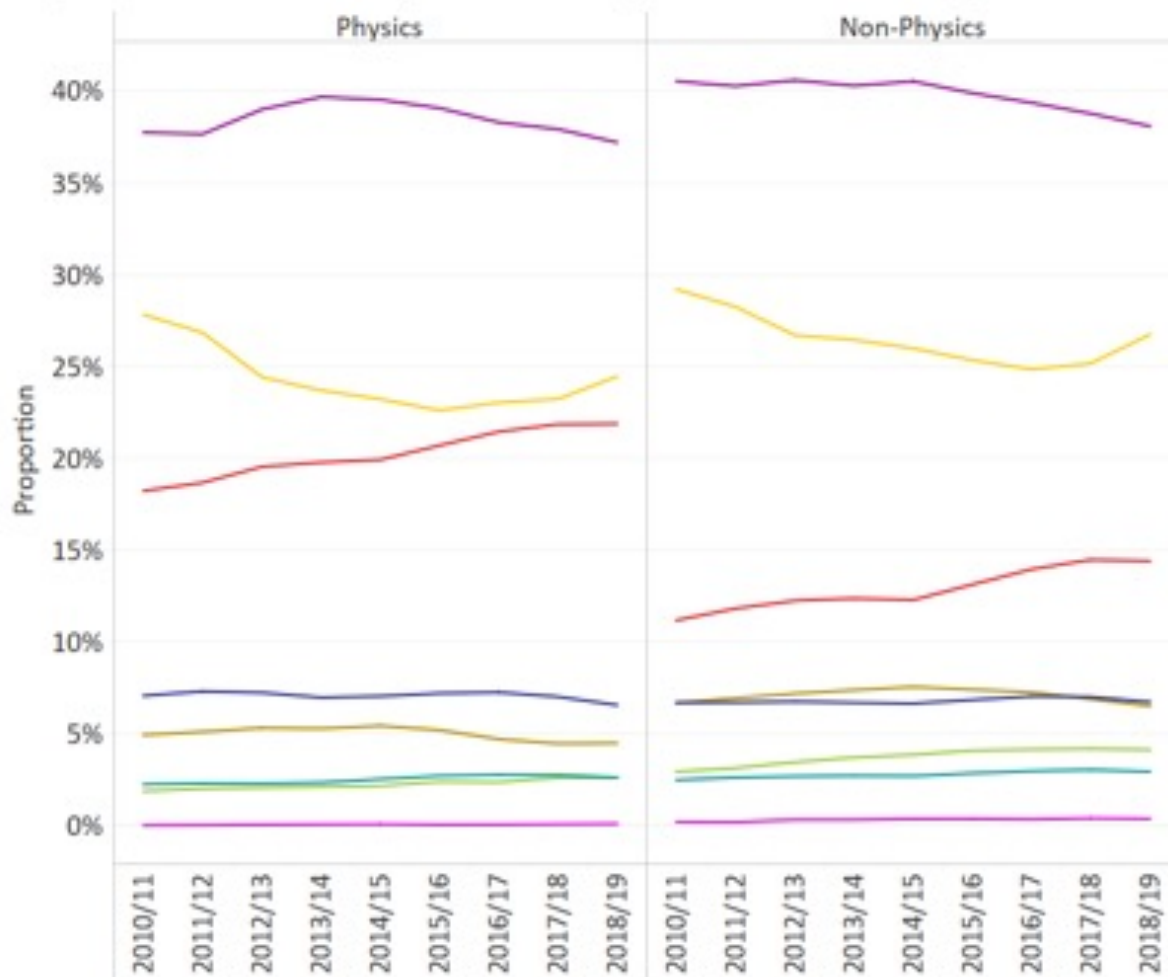


Figure 52: HESA data for Physics students by socio-economic factors for academic years 2010/11 to 2018/19.

The proportion of Physics students who come from lower managerial & professional occupations, small employers, own account workers or not classified backgrounds is comparable to that for all other subjects. The proportion of Physics students from higher managerial and professional occupations is higher than for all other subjects. In 2018/19, 22% of Physics had this socio-economic background (up 4 percentage points since 2010/11) compared to 14% for all other subjects (up 3 percentage points since 2010/11).

Physics Students Vs Non-Physics Students by Socio-Economic Backgrounds



- Socio Economic Classification (group)
- Higher managerial & professional occupations
 - Intermediate occupations
 - Lower managerial & professional occupations, Not classified, Small employers & own account workers
 - Lower supervisory & technical occupations
 - Never worked & long-term unemployed
 - Routine occupations
 - Semi-routine occupations
 - Unknown

Figure 53: HESA data for Physics students compared to all other subjects by socio-economic background for academic years 2010/11 to 2018/19.

Physics students have similar socio-economic backgrounds to other selected STEM subject students. Computer Sciences and Electronic & Electrical Engineering are the only two STEM subjects out of those selected with noticeable lower proportion of students from higher managerial and professional occupations in 2018/19.

STEM Students by Socio-Economic Backgrounds

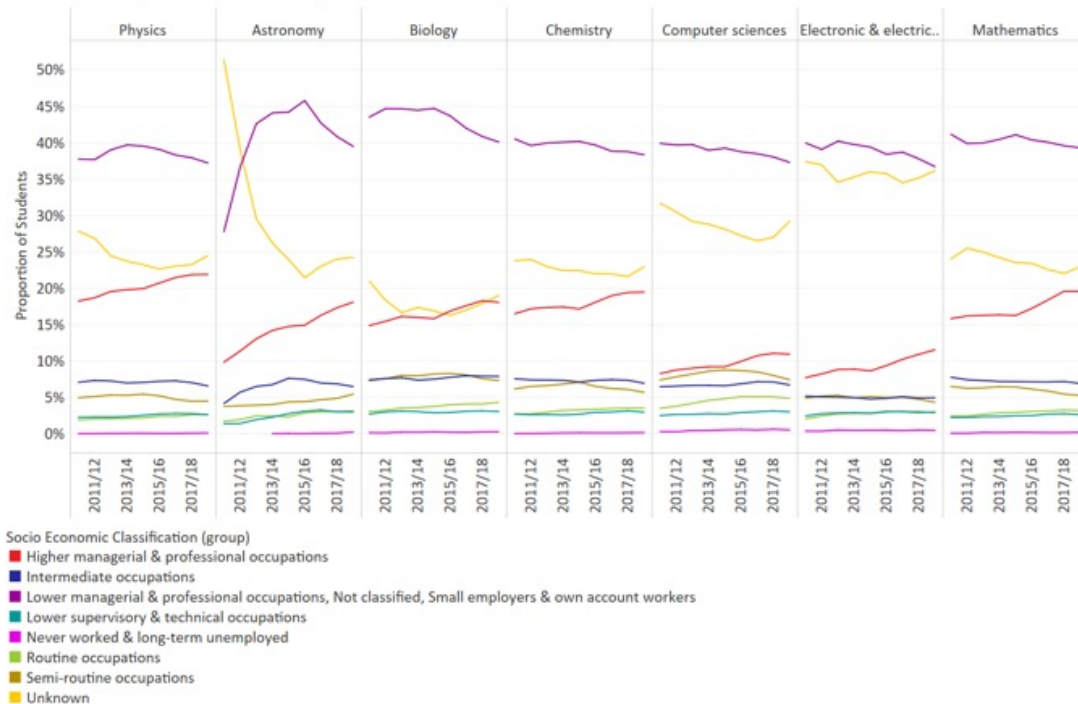


Figure 54: HESA data for selected STEM subject students by socio-economic background for 2010/11 to 2018/19.

Socio-Economic Background by Physics Undergraduates

33% of Physics undergraduate students identify their socio-economic background as being from higher managerial & professional occupations, the background with the most Physics undergraduates in. The background with the least number of Physics undergraduates in is never worked & long-term unemployed, this group represents less than 0.5% of Physics undergraduate students.

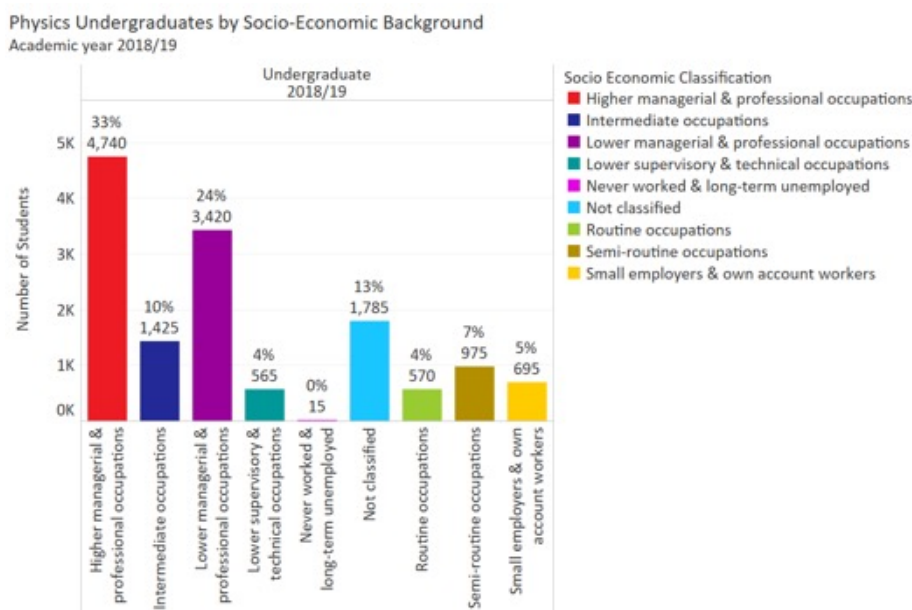


Figure 55: HESA data for Physics undergraduate students by socio-economic background for 2018/19.

Socio-Economic Background by Physics Postgraduates and Doctoral Students

58% of Physics postgraduate students' socio-economic background is recoded as not classified. This proportion is far higher than was seen for Physics undergraduates (13%). Higher managerial & professional occupations (13%) and lower managerial & professional occupations (12%) are the two socio-economic backgrounds that are classified with the highest proportion of Physics postgraduates.

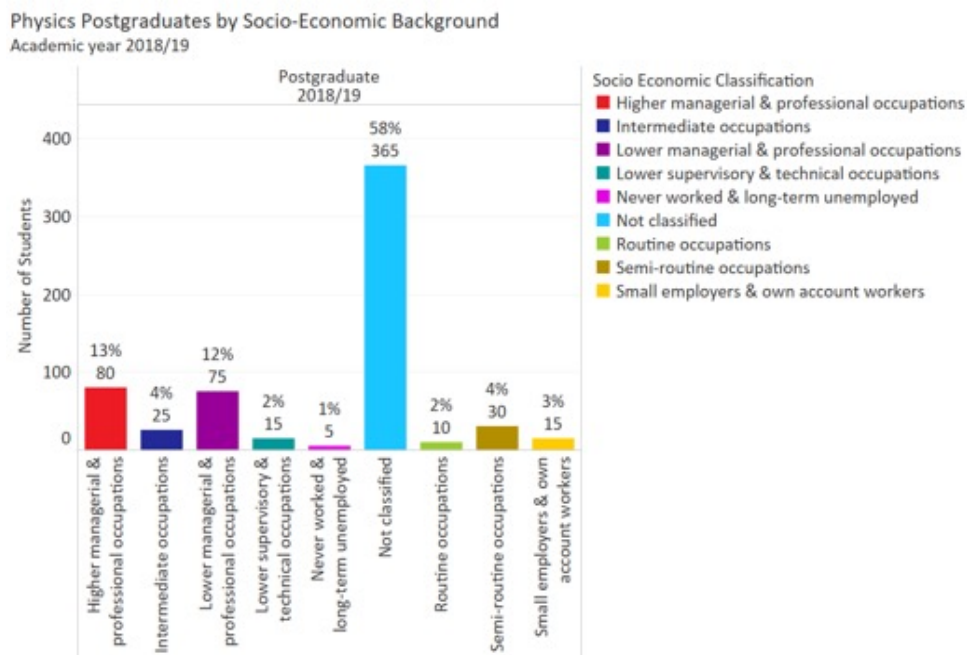


Figure 56: HESA data for Physics postgraduates by socio-economic background for 2018/19.

Socio-Economic Background by HEP Region

Figure 57, Figure 58 and Figure 59 show the socio-economic background breakdown for Physics and Astronomy students for England, Scotland and Wales respectively. All three figures show similar trends in the socio-economic breakdown for Physics and Astronomy students. Those from a higher managerial and professional occupation for all three nations is the socio-economic background that represents the highest proportion of students. The background with the second highest proportion of Physics and Astronomy students is lower managerial and professional occupation.

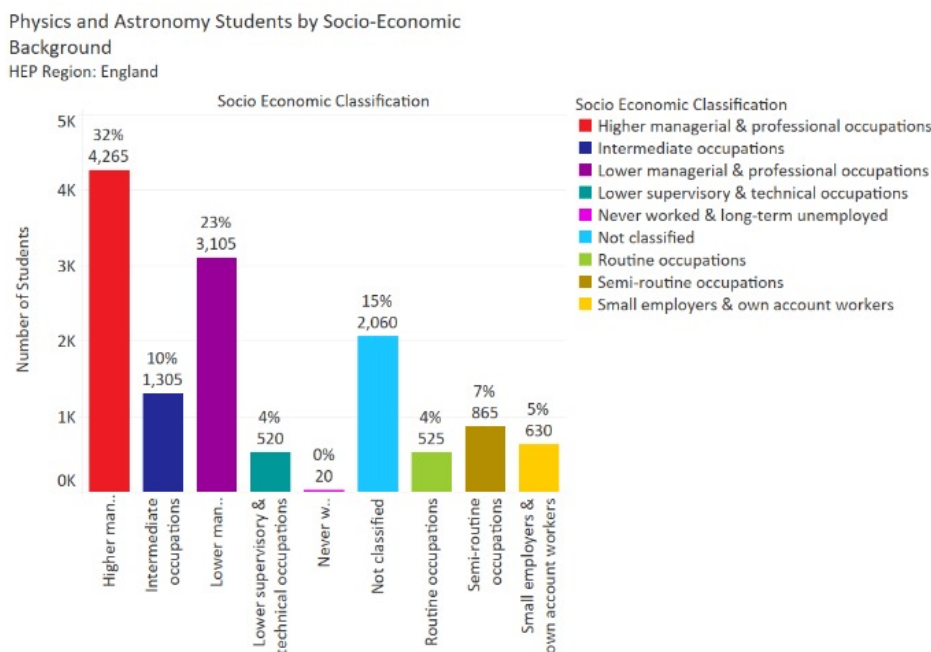


Figure 57: HESA data for Physics and Astronomy students by socio-economic background for 2018/19.

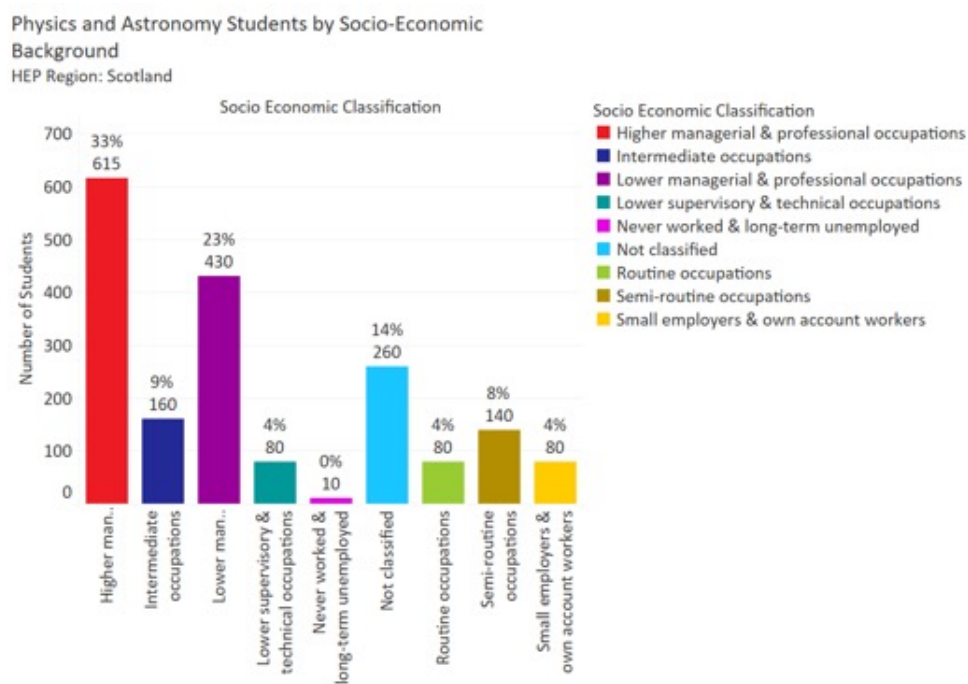


Figure 58: HESA data for Physics and Astronomy students by socio-economic background for 2018/19.

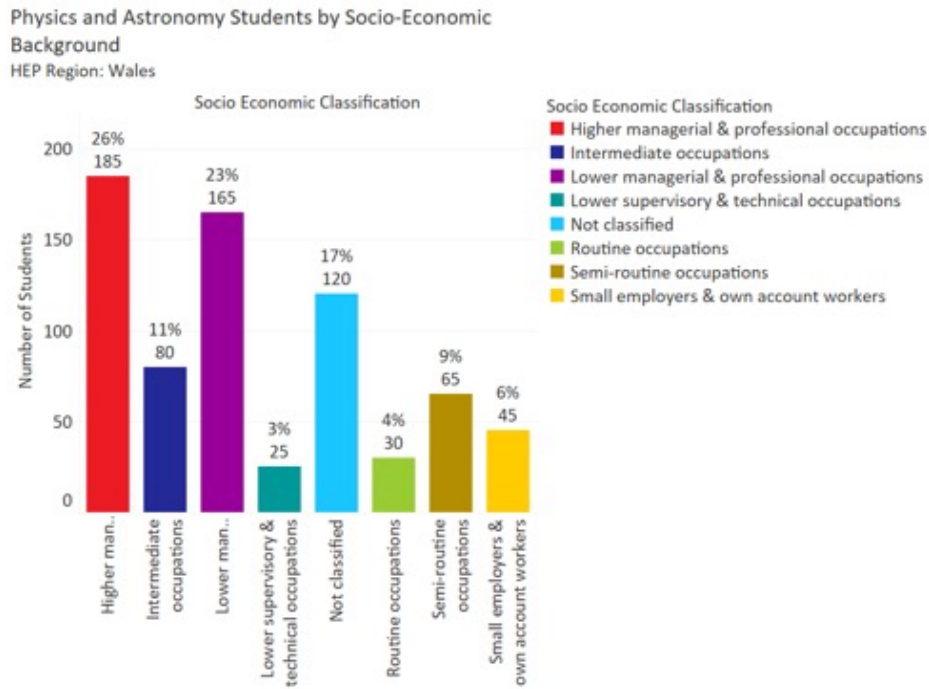


Figure 59: HESA data for Physics and Astronomy students by socio-economic background for 2018/19.

Norther Irish institutions show a slightly different trend for the socio-economic backgrounds for Physics and Astronomy students when compared to England, Scotland and Wales. Lower managerial and professional occupations represent the greatest proportion of students (27%), and higher managerial and professional occupations the second highest proportion of Physics and Astronomy students (25%).

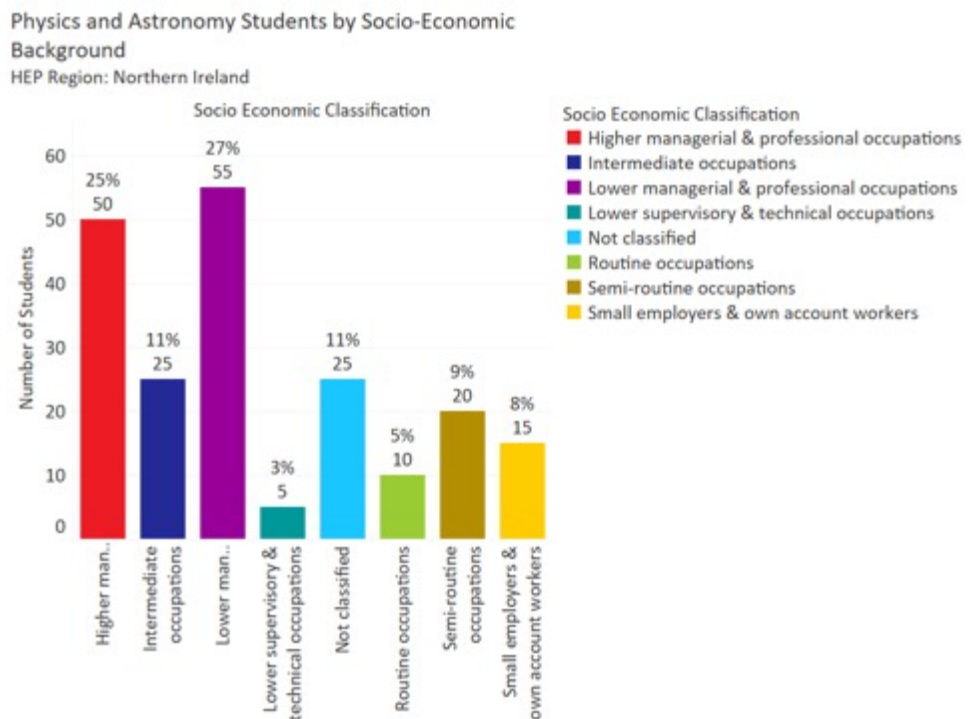


Figure 60: HESA data for Physics and Astronomy students by socio-economic background for 2018/19.

Degree Classification

This section looks at the degree classification achieved by students.

Degree Classification by Gender

Figure 61 shows the proportion of Physics students by gender that achieve each degree classification. The figure shows that 31% of female and 31% of male Physics students achieved a first-class honours degree in Physics in 2018/19. 26% of female Physics students achieved an upper second-class honours degree, compared to 24% for male Physics students.

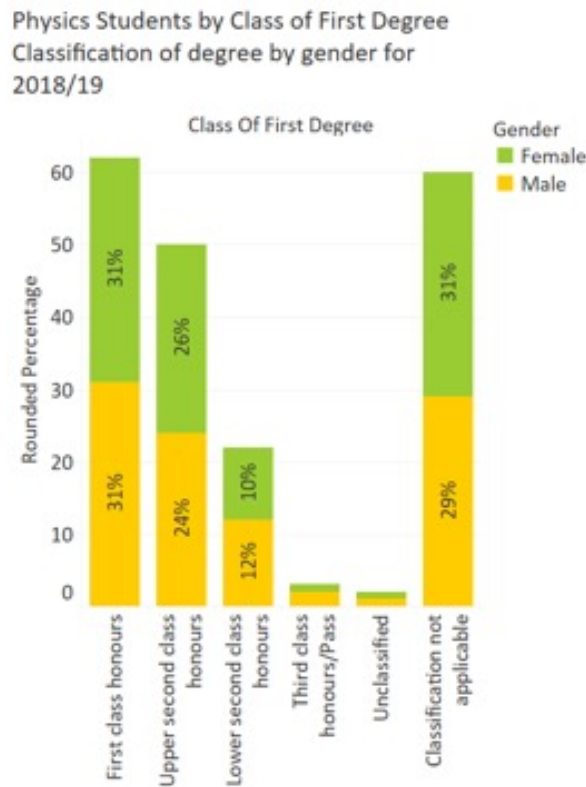


Figure 61: HESA data for the degree classification of Physics students by gender for 2018/19.

Figure 62 shows that only 24% of first-class degrees are awarded to female Physics students despite an equal proportion of male and female Physics students achieving a first-class degree. The reason for this is that there are far fewer female Physics students than there are male.

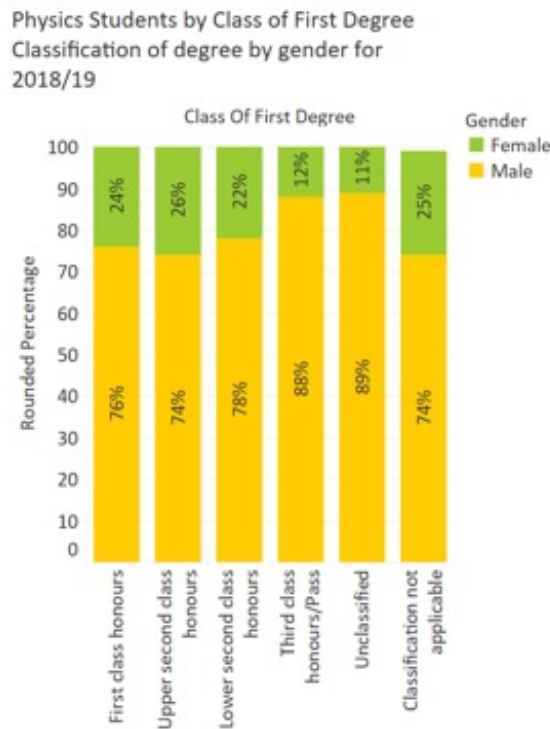


Figure 62: HESA data for the proportion of Physics students by gender for each degree classification for 2018/19.

Below, the table shows that a higher proportion of female Physics students achieve a first-class honours degrees (31%) than any other of the selected STEM subjects, the only exception to this is Mathematics (35%). The only subject with a higher proportion of female students achieving an upper second-class honours degree when compared to Physics is Biology (34%).

Subject Group	Gender	Class Of First Degree					
		First class honours	Upper second class honours	Lower second class honours	Third class honours/Pass	Unclassified	Classification not applicable
Physics	Female	31%	26%	10%	1%	1%	31%
	Male	31%	24%	12%	2%	1%	29%
Astronomy	Female	26%	22%	10%	0%	1%	41%
	Male	23%	23%	10%	3%	2%	40%
Biology	Female	24%	34%	10%	2%	1%	29%
	Male	17%	35%	14%	3%	1%	31%
Chemistry	Female	27%	30%	10%	2%	2%	30%
	Male	26%	27%	13%	3%	2%	29%
Computer Sciences	Female	22%	19%	7%	2%	2%	48%
	Male	24%	24%	13%	4%	3%	31%
Electronic & Electrical Engineering	Female	20%	14%	7%	2%	1%	58%
	Male	23%	20%	10%	3%	2%	40%
Mathematics	Female	35%	29%	14%	3%	1%	18%
	Male	30%	25%	14%	5%	3%	23%

Table 16: HESA data for selected STEM subjects by degree classification by gender for 2018/19.

Degree Classification by Nationality

For Physics, 32% of students from the graduated with a first-class honours degree in 2018/19. 26% of Physics students graduated with a first-class honours degree and were from the UK, 4% of Physics students graduated with a first-class honours degree and were from Europe. Physics students from the rest of the world, who graduated with a first-class honours degree represented 2% of the Physics student population in 2018/19.

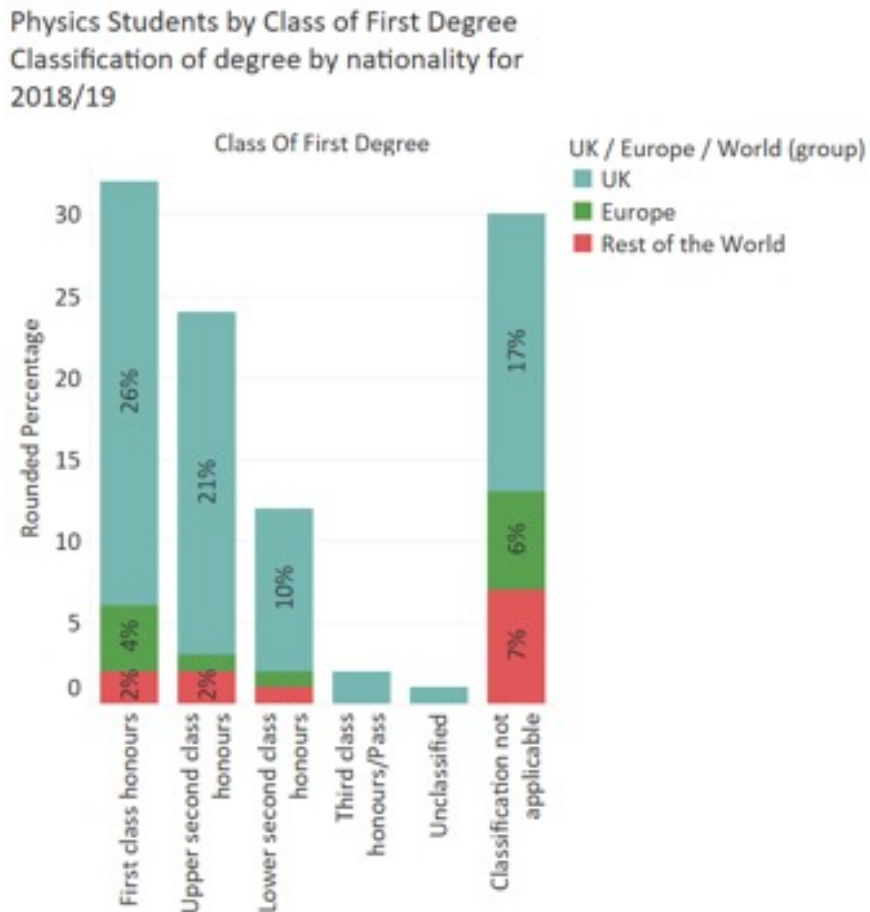


Figure 63: HESA data for Physics students by degree classification by nationality for 2018/19.

34% of Physics students from the UK achieved a first-class honours degree in 2018/19. 28% of Physics students from the UK were awarded an upper second-class degree.

30% of Physics Students from Europe were award a first-class honours degree and 16% of Physics students from the rest of the world achieved a first-class honours degree. 12% of students from Europe graduated with an upper second-class degree, for Physics students from the rest of the world this proportion was 16%.

A large proportion of degree classifications for students from Europe and from the rest of the world are classified as 'Classification not applicable'.

Physics was amongst the top two selected STEM subjects with the highest proportion of first-class degrees awarded to students for each nationality.

UK / Europe / World (group)	Subject Group	Class Of First Degree					
		First class honours	Upper second class honours	Lower second class honours	Third class honours/Pass	Unclassified	Classification not applicable
UK	Physics	34%	28%	13%	2%	1%	22%
	Astronomy	26%	25%	11%	2%	1%	34%
	Biology	23%	38%	12%	2%	1%	24%
	Chemistry	30%	33%	13%	3%	2%	20%
	Computer Sciences	28%	28%	14%	4%	3%	22%
	Electronic & Electrical Engineering	33%	28%	13%	3%	4%	19%
	Mathematics	35%	31%	16%	5%	2%	11%
Europe	Physics	30%	12%	6%	1%	1%	50%
	Astronomy	22%	14%	10%		3%	51%
	Biology	19%	25%	10%	1%	2%	43%
	Chemistry	22%	16%	5%	1%	3%	53%
	Computer Sciences	29%	20%	7%	2%	3%	39%
	Electronic & Electrical Engineering	28%	16%	5%	1%	1%	49%
	Mathematics	25%	14%	8%	2%	4%	48%
Rest of the World	Physics	16%	16%	9%	1%	1%	57%
	Astronomy	4%	12%	1%	2%	1%	82%
	Biology	10%	17%	8%	2%	0%	63%
	Chemistry	10%	14%	9%	3%	0%	64%
	Computer Sciences	9%	10%	6%	2%	1%	73%
	Electronic & Electrical Engineering	14%	12%	8%	3%	0%	62%
	Mathematics	23%	16%	12%	5%	1%	44%

Table 17: HESA data for selected STEM subjects by nationality for degree classification for 2018/19.

