IOP Institute of Physics

Students in UK physics departments

The Institute of Physics (IOP) is the professional body and learned society for physics in the UK and Ireland. We seek to raise public awareness and understanding of physics and support the development of a diverse and inclusive physics community. As a charity, the IOP's mission is to ensure that physics delivers on its exceptional potential to benefit society.

This briefing provides outline statistics on physics students in UK universities in the 2017/18 academic year alongside statistics on selected STEM subjects (electronic and electrical engineering, astronomy, mathematics, chemistry, and biology) and on all other subjects. The data source is the Higher Education Statistics Agency (HESA).[1]

The data is broken down by gender, age, ethnicity, domicile and disability, and includes comparisons between Russell Group and non-Russell Group universities.

Summary

In 2017/18, a total of
24% of physics students were female,
up from
21% in 2012/13.

A greater proportion of physics students from outside of the UK were female (31%)
than their UK-domiciled counterparts (22%).

There were
38%
more female physics undergraduate students
in 2017/18 than in 2012/13.

Female undergraduate physics students achieved marginally higher degree classes
than their male counterparts.

Compared with other subjects,
the gender split among physics students didn't vary very much
by level of study, ethnicity, or whether the institution is part of the Russell Group.

83%
of UK-domiciled physics students were white,
the second-highest percentage of the subjects considered, after astronomy.

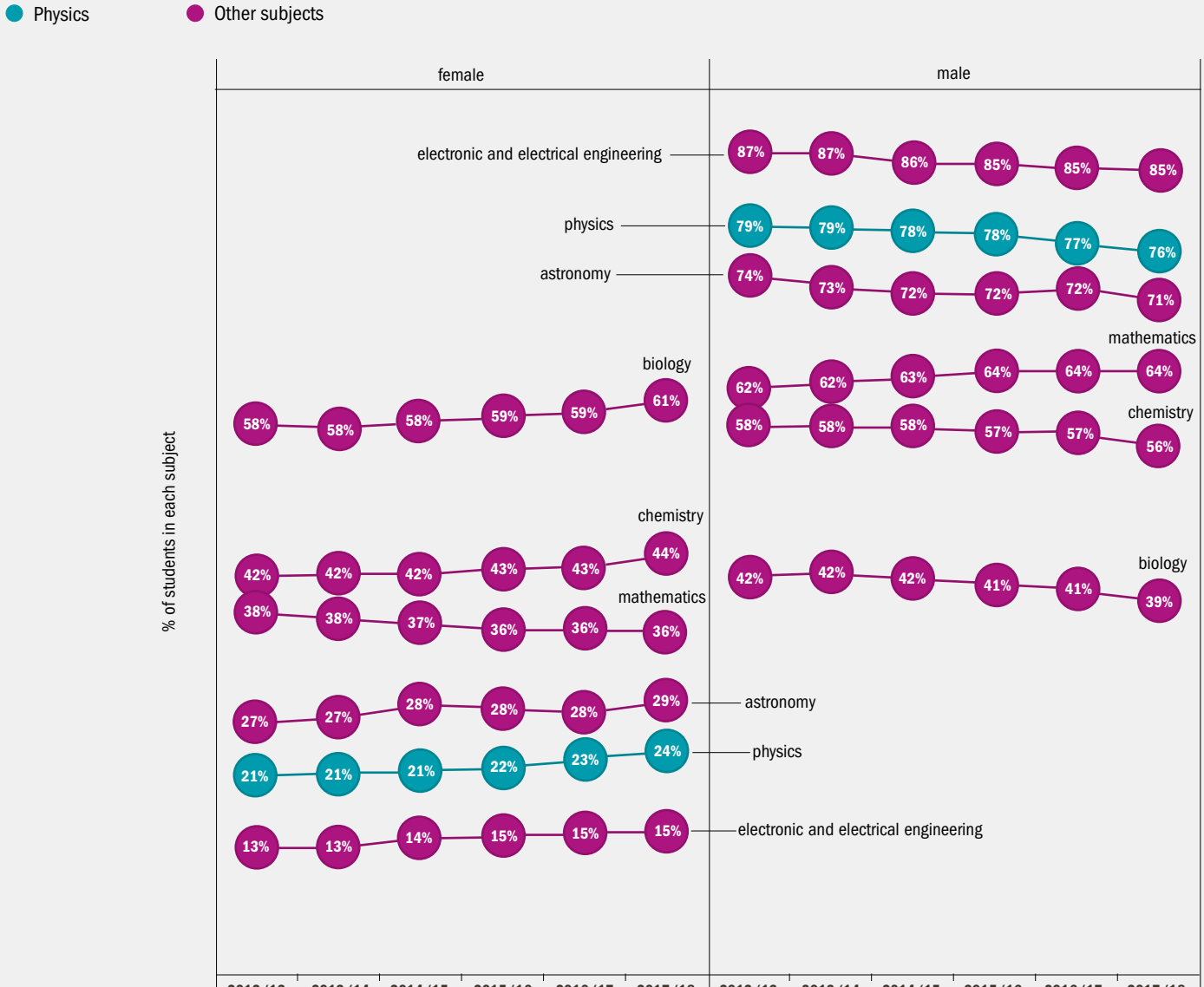
[1] Source(s): HESA Student Record 2012/13; HESA Student Record 2013/14;HESA Student Record 2014/15;HESA Student Record 2015/16; HESA Student Record 2016/17; HESA Student Record 2017/18. Copyright Higher Education Statistics Agency Limited. Neither the Higher Education Statistics Agency Limited nor HESA Services Limited can accept responsibility for any inferences or conclusions derived by third parties from data or other information supplied by HESA Services.

Gender[2] of students

The percentage of physics students who were male has decreased from **79%**[3] in 2012/13 to **76%** in 2017/18. The change was because of a continued increase in the number of female students, while growth in male student numbers slowed.

Biology, chemistry, astronomy, and electronic and electrical engineering also had a greater proportion of female students in 2017/18 than in 2012/13, though in the case of electronic and electrical engineering this was because the number of male students decreased, rather than an increase in female students. Mathematics was unusual amongst the subjects we looked at in having a greater proportion of male students in 2017/18 than in 2012/13.

Proportion and number of students of all levels by gender, 2012/13 to 2017/18



	female						male					
	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
electronic and electrical engineering	3,820	3,645	3,865	3,905	3,905	3,925	24,905	23,760	23,200	22,820	22,345	22,110
physics	3,885	4,185	4,480	4,685	4,980	5,215	14,605	15,600	16,375	16,840	16,880	16,835
astronomy	555	565	600	650	685	780	1,540	1,515	1,520	1,665	1,795	1,925
mathematics	13,735	13,635	13,570	13,565	13,745	13,915	22,305	22,720	23,085	23,725	24,115	24,495
chemistry	9,180	9,645	10,045	10,430	10,530	10,970	12,710	13,180	13,735	13,950	14,050	13,805
biology	16,590	16,790	17,555	18,270	18,900	19,605	12,005	12,335	12,570	12,770	12,920	12,735

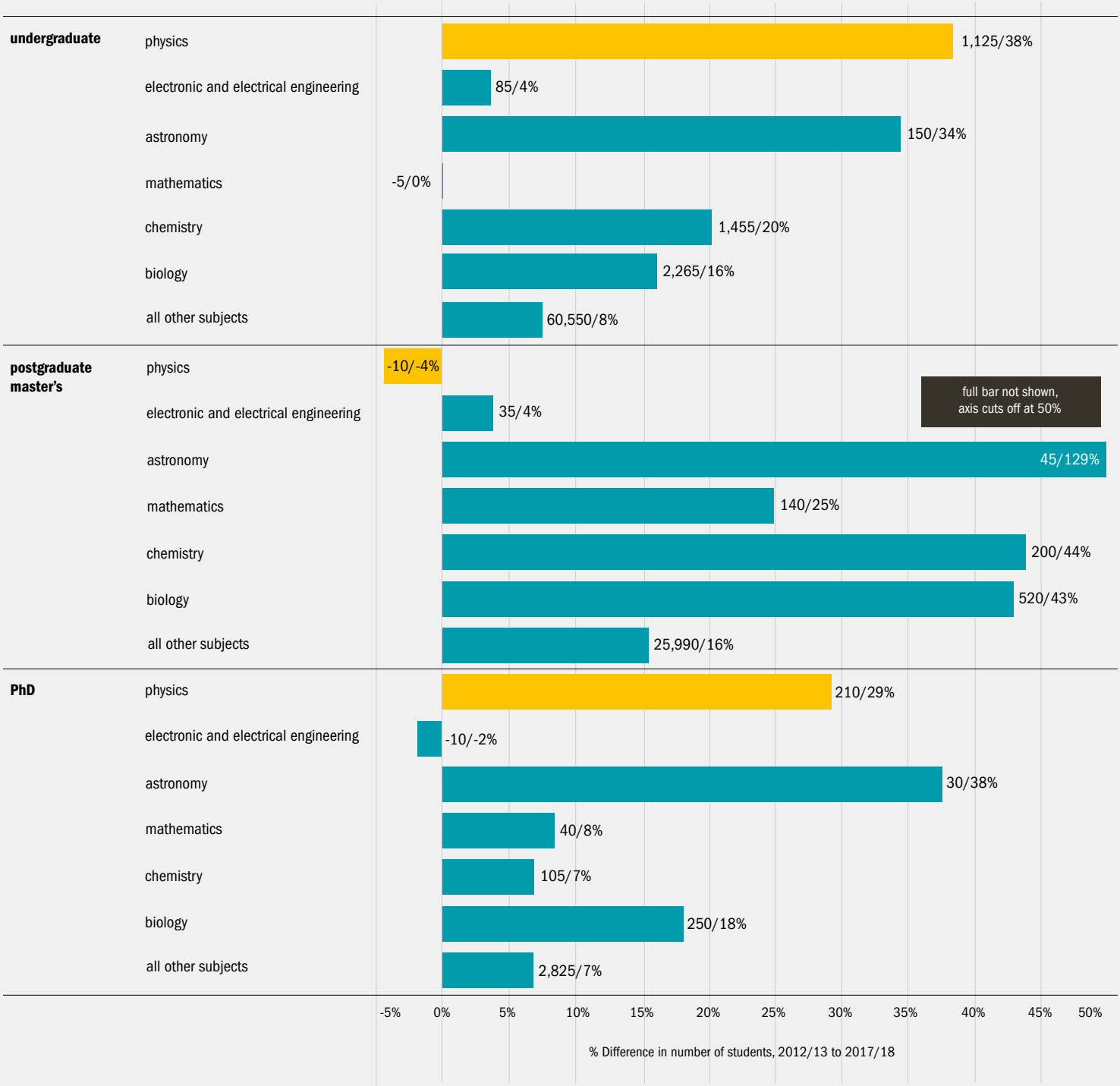
[2] Gender totals are derived from HESA's Sexual Identification data field, which broadly reflects students' gender identity; 'other' includes intersex, androgyne, intergender, ambigender, gender fluid, polygender and genderqueer https://www.hesa.ac.uk/collection/c17051/a/sexid

[3] The figures at the bottom of the table reflect counts of students rounded to the nearest 5. The percentages shown are calculated using these rounded figures, and are themselves rounded to the nearest one per cent. In this table, rounded totals of students whose gender is recorded as "other" aren't shown, but are included in the percentage calculations. Because of this, and rounding the percentage figures, the percentage figures won't always add to 100%.

Change in number of female students

Physics has had the largest increase in female undergraduate students of the six subjects we compared in UK universities since 2012/13; **38%** more female undergraduate students in 2017/18 than in 2012/13. It has also seen a **29%** increase in female PhD students over the same period. The number of female master's students however fell by **4%**.

Growth in number of female students in 2017/18 relative to 2012/13, by subject and level of study



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Gender split by subject in 2017/18

There were **5,215** female physics students in the UK in 2017/18. This was **24%** of the total number of physics students. This was lower than in most the other selected STEM subjects. Female students made up **36%** of the mathematics cohort and **61%** of the biology cohort.[3]

Gender split of students

[3] The figures split by gender may not add to the total, as both the overall number of students by subject and breakdowns are rounded to the nearest five. The gender split breakdown figures are used to calculate the percentages, which are rounded to the nearest one per cent.

Gender and level of study

Physics had a similar gender split at undergraduate and postgraduate levels in the academic year 2017/18. Mathematics and biology had a higher proportion of male students at postgraduate level than at undergraduate level. In chemistry, **49%** of postgraduate master's students were male, but **60%** of PhD students were male, with the undergraduate level being between the two.[4]

There were **3.4** female undergraduate physics students for every postgraduate (postgraduate master's, PhD, and any other postgraduate study) student in 2017/18. This is a smaller ratio than both their male counterparts (3.8) and males or females in mathematics, chemistry, and biology.

Different subjects had very different profiles in the way that gender splits changed according to level of study; there were many more female physics undergraduate students than female electronic and electrical engineering undergraduate students, but the reverse was true at postgraduate level.

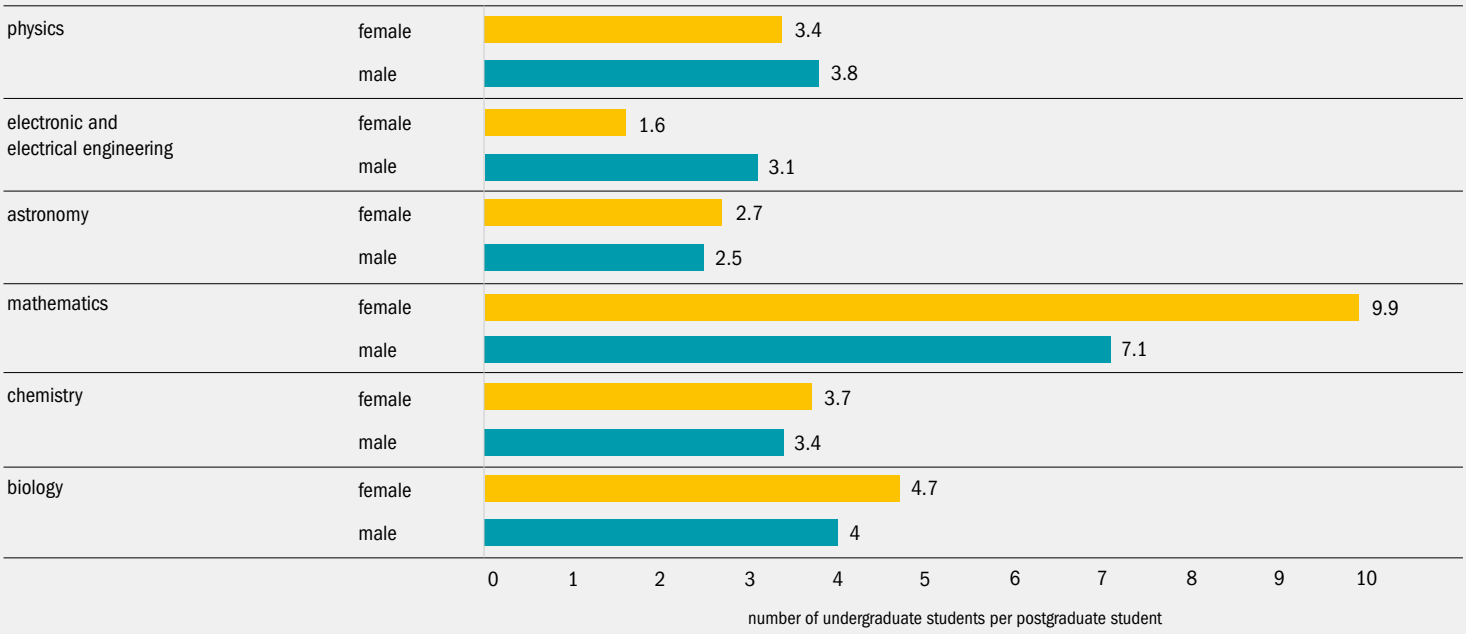
Gender of students by subject and level of study, 2017/18

male female other

subject	undergraduate	postgraduate master's	PhD	undergraduate		postgraduate master's		PhD	
physics	17,440	865	3,735	77%	23%	73%	26%	75%	25%
electronic and electrical engineering	19,105	4,000	2,805	87%	13%	77%	23%	80%	20%
astronomy	1,975	325	380	70%	30%	76%	24%	71%	29%
mathematics	34,140	2,120	2,055	63%	37%	67%	33%	74%	25%
chemistry	19,360	1,295	4,025	55%	45%	49%	51%	60%	40%
biology	26,380	2,895	2,960	39%	61%	40%	60%	45%	55%
all other subjects	1,503,325	333,175	85,790	43%	57%	42%	58%	48%	51%

Number of undergraduate students per postgraduate student, 2017/18

male female



[4] The gender split bars shown reflect proportions of rounded counts of students of each gender; rounded totals below five aren't included. The percentage labels are rounded to the nearest 1%.

Gender and ethnicity

Physics students' (undergraduate, postgraduate master's and PhD combined) gender split was relatively consistent across different ethnicities. For example, **78%**[5] of white physics students were male and **76%** of Asian or Asian British physics students were male. By comparison **60%** of white chemistry students were male, but **49%** of Asian or Asian British chemistry students were male.

White postgraduate students had a very similar gender breakdown at undergraduate and postgraduate levels. Females made up a higher proportion of Asian students at postgraduate levels (**29%**) than their undergraduate counterparts (**24%**).

Gender of students by subject and ethnicity, 2017/18

male female other

subject	gender	white	asian or asian British	black or black British	other ethnicities	white	asian or asian British	black or black British	other ethnicities
physics	female	3,245	305	75	290	22%	24%	30%	24%
	male	11,780	965	175	900	78%	76%	70%	76%
electronic and electrical engineering	female	975	225	145	185	10%	11%	11%	16%
	male	8,825	1,735	1,130	1,005	90%	89%	89%	84%
mathematics	female	8,050	1,470	405	830	34%	38%	40%	36%
	male	15,490	2,355	605	1,490	66%	62%	60%	64%
chemistry	female	6,110	1,205	520	715	40%	51%	58%	48%
	male	9,205	1,140	375	770	60%	49%	42%	52%
biology	female	12,395	1,840	850	1,120	59%	65%	66%	62%
	male	8,700	1,010	435	690	41%	35%	34%	38%
astronomy	female	510	40	5	50	26%	32%	25%	37%
	male	1,430	85	15	85	74%	68%	75%	63%
all other subjects	female	723,825	88,040	72,460	59,720	59%	54%	60%	57%
	male	495,185	76,395	48,300	44,510	41%	46%	40%	43%

Physics students by level of study and ethnicity, 2017/18

level	gender	white	asian or asian British	black or black British	other ethnicities	white	asian or asian British	black or black British	other ethnicities
undergraduate	female	2,715	265	70	245	22%	24%	30%	24%
	male	9,870	860	160	760	78%	76%	70%	76%
postgraduate	female	525	40	5	45	22%	29%	25%	24%
	male	1,910	100	15	140	78%	71%	75%	76%

[5] Other genders and unknown ethnicities are not shown in this figure. Percentages are calculated using the total of the rounded figures shown; a true percentage using unrounded figures would be slightly different.

Gender and domicile

Non-UK domiciled physics students were more likely to be female than UK-domiciled students; **31%** of non-UK EU physics students, and **30%** of non-EU physics students were female in the 2017/18 academic year, compared with only **22%** of UK-domiciled students.

The five other subjects examined also had a higher proportion of female students among their non-UK domiciled cohort, to differing extents. This was not seen among all other subjects however, where the proportion of female students in the non-UK domiciled cohort was slightly lower than in the UK-domiciled cohort.

Genders of students by subject and domicile, 2017/18

male female

subject	gender	UK	non-UK EU	non-EU	UK	non-UK EU	non-EU
physics	female	3,985	630	600	22%	31%	30%
	male	14,045	1,415	1,375	78%	69%	69%
electronic and electrical engineering	female	1,555	270	2,105	11%	14%	22%
	male	12,940	1,690	7,480	89%	86%	78%
mathematics	female	10,860	805	2,250	35%	34%	46%
	male	20,260	1,555	2,680	65%	66%	54%
chemistry	female	8,640	915	1,415	43%	53%	51%
	male	11,640	815	1,350	57%	47%	49%
biology	female	16,305	1,665	1,640	60%	67%	63%
	male	10,985	805	945	40%	33%	37%
astronomy	female	615	80	85	27%	39%	35%
	male	1,650	120	150	73%	59%	63%
all other subjects	female	955,740	70,600	155,620	59%	57%	55%
	male	675,920	53,255	129,380	41%	43%	45%

Gender and Russell Group universities

In the 2017/18 academic year, **67%** of physics students attended Russell Group universities. This was a higher proportion than some other STEM subjects (**59%** of chemistry students and **52%** of mathematics students). A slightly greater proportion of physics students at Russell Group universities were female than at non-Russell Group universities (**24%** female compared with **22%** female).

This was also true of electronic and electrical engineering (**19%** compared with **12%**) and astronomy (**31%** compared with **27%**). The converse was true of mathematics, chemistry and biology, for which the gender imbalance was greater at Russell Group universities than at non-Russell group universities.

Gender of students by subject and whether enrolled at Russell Group universities, 2017/18

male female other

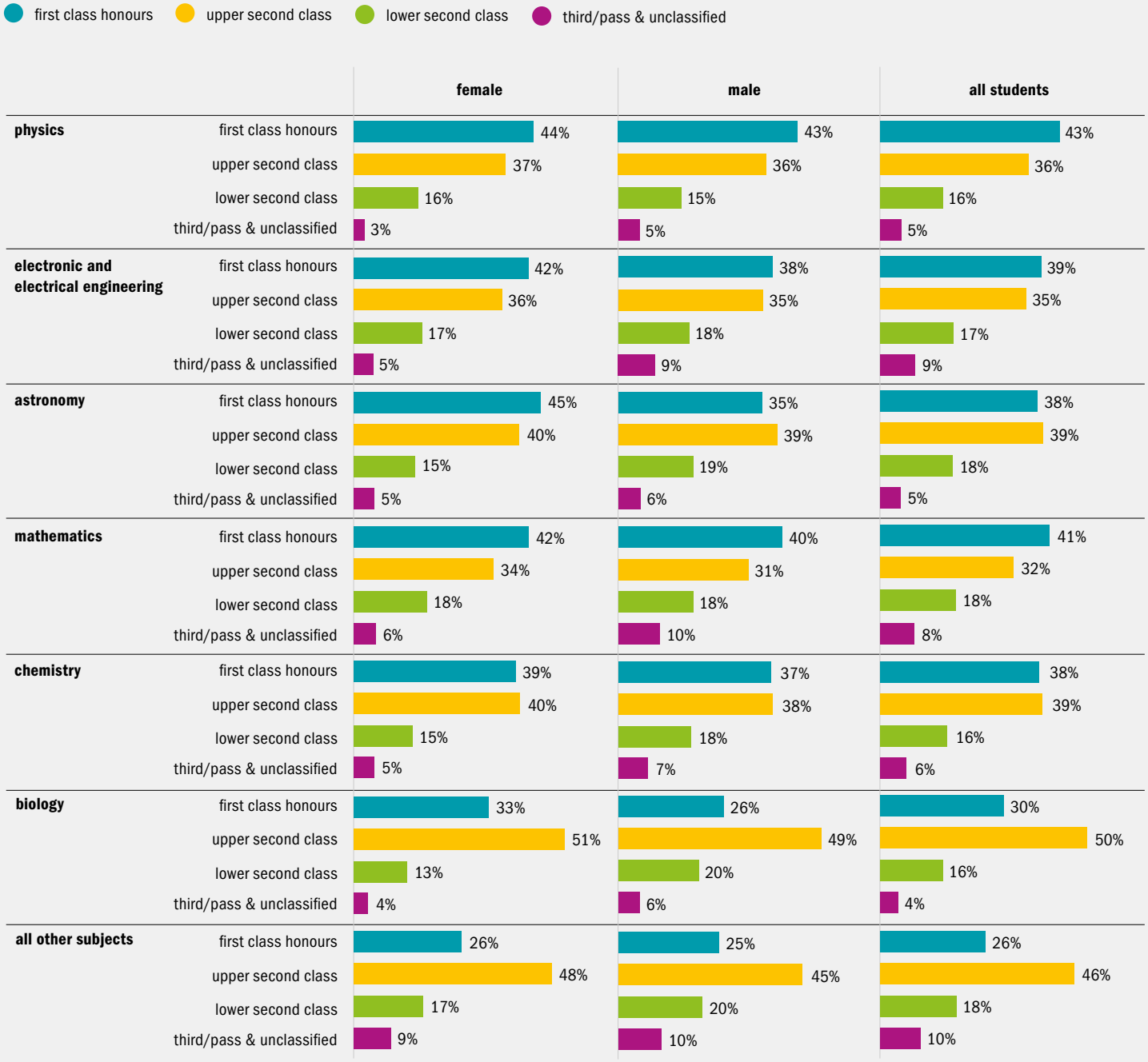
subject	Russell Group	non-Russell Group	Russell Group	non-Russell Group
physics	14,895	7,185	75% 24%	78% 22%
electronic and electrical engineering	11,140	14,910	81% 19%	88% 12%
astronomy	1,355	1,350	69% 31%	73% 27%
mathematics	20,365	18,075	65% 35%	62% 38%
chemistry	14,590	10,195	56% 44%	55% 45%
biology	12,840	19,515	38% 62%	40% 59%
all other subjects	553,460	1,488,405	43% 57%	42% 58%

Gender and outcomes

There were 4,080 graduates from undergraduate physics courses in UK universities in the 2017/18 academic year, 950 of which were female and 3,130 of which were male. Of these graduates, **81%** of female students and **79%** of male students achieved a first-class or upper-second-class degree.

Outcomes in degree class didn't vary much by gender across the six subjects considered, or across all other subjects combined, though male students were slightly less likely to achieve a first class degree and were slightly more likely to achieve a third class or unclassified degree in all the subjects compared. The largest variation by gender among the subjects was in biology, for which **20%** of male students achieved a lower second class degree, compared with **13%** of female students.

Degree class achieved by graduates from undergraduate courses in 2017/18, by gender

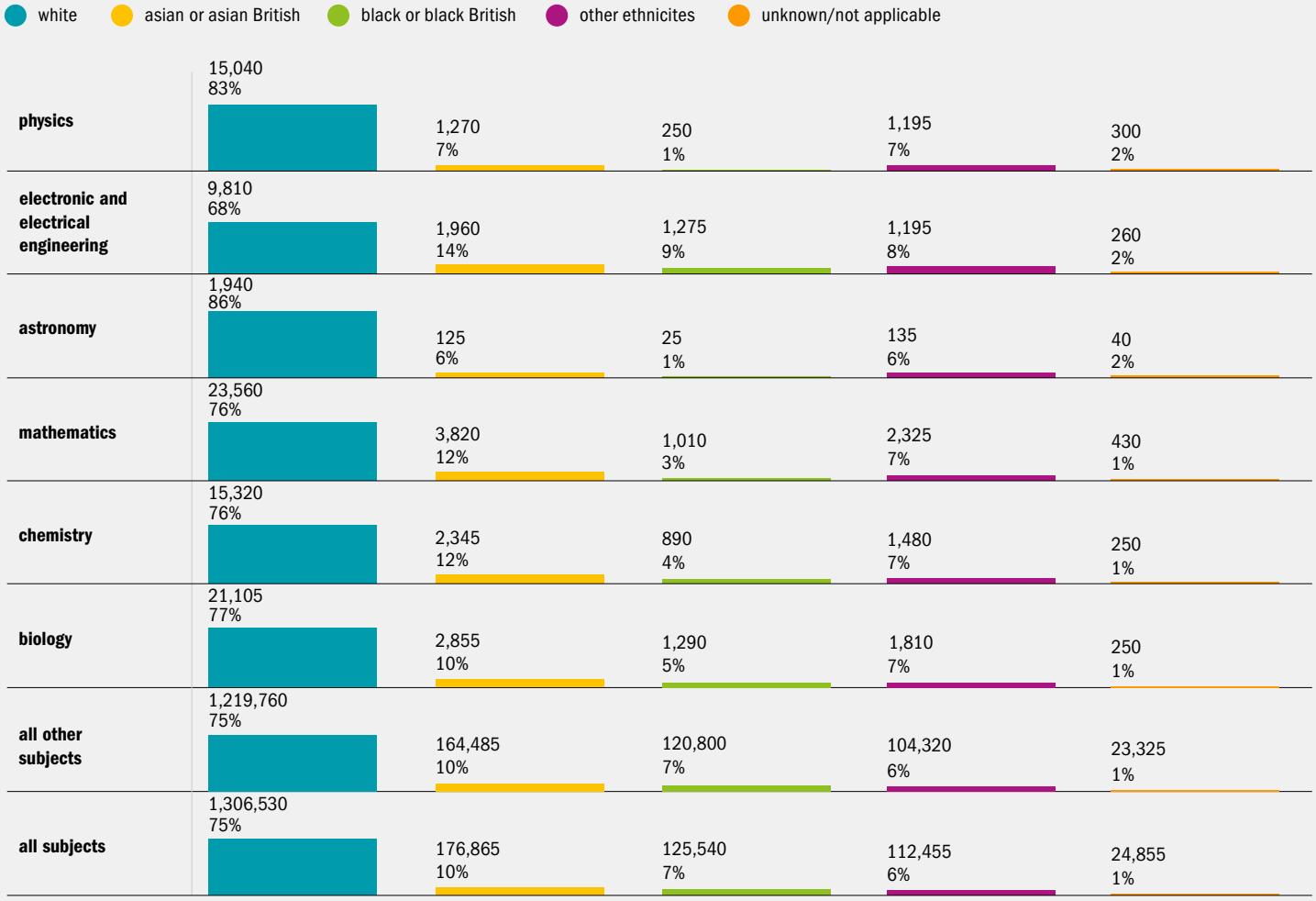


Ethnicity

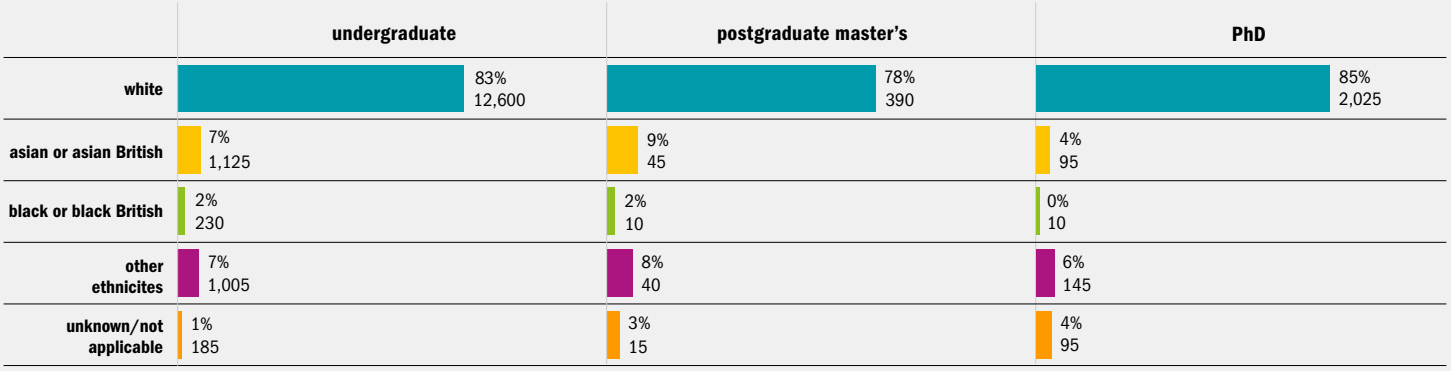
Of UK-domiciled[6] students (undergraduate, postgraduate master's and PhD combined) in the 2017/18 academic year, **83%** of physics students were white[7], compared with **75%** of all other subject students. Electronic and electrical engineering attracted a much higher proportion of black and Asian students (**23%**) than other subjects.

Splitting physics students by ethnicity and level of study, a greater proportion of PhD students in 2017/18 were white compared with undergraduate or master's levels. **85%** of UK-domiciled PhD students were white, or **89%** if excluding students with unknown ethnicities from the calculation.

Ethnicities of UK-domiciled students by subject, 2017/18



Ethnic distribution of UK-domiciled physics students, 2017/18



[6] UK-domiciled students used here because non-UK domiciled students contain a large proportion with ethnicity classified as unknown/not applicable.

[7] Ethnicities have been grouped as follows: White refers to white, Asian or Asian-British groups Bangladeshi, Indian, Pakistani, and other Asian backgrounds (ex. Chinese). Black or Black British includes African, Caribbean, and other black backgrounds, and other ethnicities is made up of Mixed and Chinese students.

Domicile

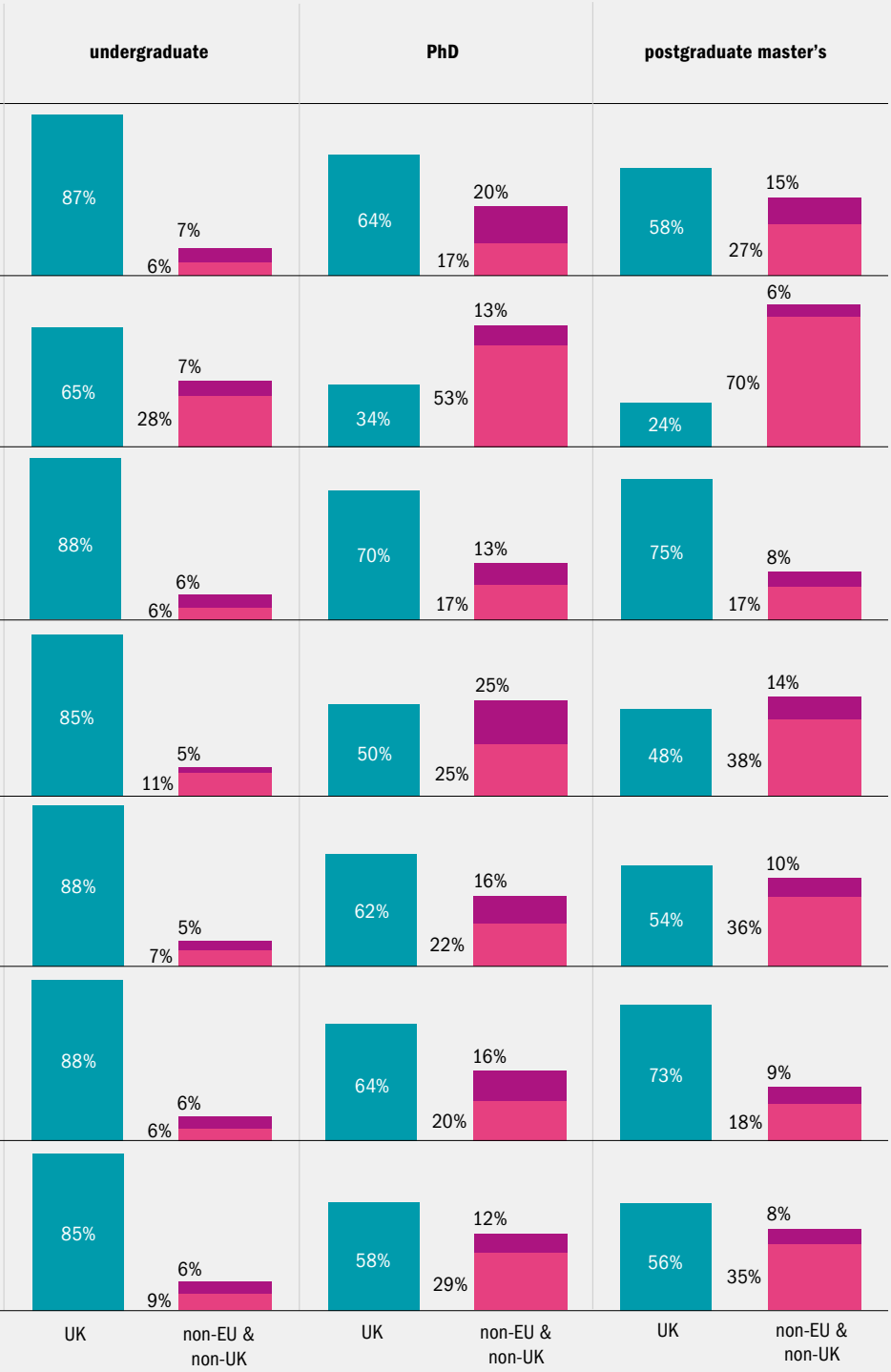
Physics students from outside the UK made up a much greater proportion of the total at postgraduate master's and PhD level (**42%** and **37%**, respectively) than at undergraduate level (**13%**).

All five other subjects displayed a similar pattern, to a greater or lesser extent. More than half of mathematics students at postgraduate level were from outside the UK, and almost three quarters of electronic and electrical engineering postgraduate master's students were from outside the UK.

Domiciles of students by subject and level of study, 2017/18

non-UK UK non-EU

subject	undergraduate	postgraduate master's	PhD
physics	17,440	865	3,735
electronic and electrical engineering	19,105	4,000	2,805
astronomy	1,975	325	380
mathematics	34,140	2,120	2,055
chemistry	19,360	1,295	4,025
biology	26,380	2,895	2,960
all other subjects	1,503,325	333,175	85,790



Disability

Physics students in the academic year 2017/18 were equally likely to have no known disability (**87%**) as students of other subjects.

Physics and mathematics students were more likely to have a social communication or autistic spectrum disorder than students of other subjects. Of the physics and mathematics students with a known disability, **12%** declared a social communication/autistic spectrum disorder, compared with only **3%** of students from beyond our six compared subjects.

% of students with no known disability: physics & non-physics, 2017/18

Breakdown of known disabilities by subject, 2017/18

	physics	electronic and electrical engineering	astronomy	mathematics	chemistry	biology	all other subjects
social communication/ autistic spectrum	12%	8%	12%	12%	6%	4%	3%
specific learning difficulty	33%	44%	29%	26%	35%	35%	38%
mental health condition	26%	19%	28%	26%	26%	28%	24%
a long-standing illness or health condition	9%	9%	9%	10%	12%	11%	10%
two or more conditions	9%	8%	11%	12%	8%	9%	10%
another disability, impairment or medical	7%	8%	8%	8%	8%	8%	8%
a physical impairment or mobility issues	2%	2%	3%	2%	3%	3%	3%
blind or serious visual impairment	1%	2%	1%	2%	1%	1%	1%
deaf or serious hearing impairment	1%	2%	1%	2%	1%	1%	2%

[8] Percentages are calculated by taking a rounded count of each subject and disability, and taking the sum of those rounded figures, which may not add to the total figure with a disability. Percentages are also rounded to the nearest one per cent and may not add to 100.