

# Diversity in University Physics

Statistical Digest 2010



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## Executive summary

This digest provides a concise overview of the diversity profiles of academic staff in university physics cost centres in the UK, based on HESA data 2007/08. It provides a snapshot of the profiles of staff in university physics cost centres and highlights changes since the last digest was produced in 2007, which was based on HESA data from 2005/06.

In the UK, there are 52 physics cost centres, which, in 2007/08, employed a total of 3753 academic staff across the grades of researcher, lecturer, senior lecturer or researcher and professor.

Overall, just over one in seven (14.7%) of all academic staff were women, a figure that has shown a steady growth over the last decade. In recent years, there has been a sharp increase in the percentage of female lecturers and senior lecturers in particular. However, the grade of researcher, which represents 56% of all female staff, has shown the slowest growth in percentage terms of female staff.

There were five cost centres that employed no female staff at all, while seven cost centres had more than 20% of female staff.

When cost centres were grouped by size:

- small cost centres had lower proportions of female staff at junior grades but higher proportions at senior grades;
- medium cost centres had a high proportion of female lecturers but fewer female staff at higher levels;
- large cost centres employed women at every grade level.

Across all grades, a higher proportion of female staff worked part-time compared to male staff.

For both men and women the proportion of staff who were UK nationals rose with seniority; across all grades the percentage of staff who were UK nationals was lower for women than for men. Since 2004/05 there has been a large increase in the percentage of female senior lecturers from the European Union.

The ethnicity of academic staff in physics cost centres was broadly the same for men and women, with the vast majority (over 88%) identifying themselves as “white”.

The age profile of academic staff shows that women were generally younger than men.

1.2% of all academic staff in physics cost centres declared that they have a disability.

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# 1: Introduction: about the digest

This digest provides a concise overview of the diversity profiles of academic staff in university physics cost centres in 2007/08 in the UK. It is an update of the Institute of Physics publication *Women in University Physics Departments: Statistical Digest 2007*, which used HESA data for the 2005/06 academic year and only looked at the gender profile of physics cost centres.

The information will be of interest to all relevant staff in university physics cost centres, particularly heads of departments and those staff members who are preparing Juno or Athena SWAN applications for their department.

It will enable staff to:

- understand the profiles of staff in university physics cost centres;
- compare the gender and diversity profile of their own cost centres with that of other university physics cost centres;
- gain an insight into the changes in the gender profile of university physics cost centres over the last decade.

The data used for the main part of this analysis were the 2007/08 HESA data. The grades were grouped as follows:

- researchers (excluding senior researchers);
- lecturers;
- senior lecturers (including senior researchers);
- professors.

HESA also provides data for academic staff that do not fall into the grade groups described above and are referred to as “other grades”. The numbers of other grade staff have been excluded from the analysis in this digest in order to make comparisons with the previous digest, which did not include them. In the other grades category, there were 348 staff representing 8.5% of all academic staff, 24% of whom were female; 88.3% worked part-time and 84.4% were teaching-only positions.

For the historical analysis HESA data for each year from 1996/97 to 2007/08 were used.

It should be noted that the manner with which each institution defines their grade structure is becoming increasingly inconsistent and the grade groups listed above are as those currently defined by HESA. For more information on how HESA categorises staff, visit [www.hesa.ac.uk](http://www.hesa.ac.uk).

## 2: Gender profile of physics cost centres

1. HESA Student Data 2007/08

### 2.1: Gender profile by grade across all cost centres

As is well known, the percentage of women in university physics cost centres decreases as the level of grade increases (figure 1). The exception to this has been in moving from researcher to lecturer where the percentage of women is greater at lecturer than at researcher level. At 19.8%, the percentage of female physics lecturers was

2% lower than the percentage of female undergraduates (21.7%) and nearly 7% lower than the percentage of female postgraduates (26.5%)<sup>1</sup>. The higher proportion of women taking postgraduate degrees indicates that female students were more likely than their male peers to go on to further graduate study in physics. However, when moving on to postdoctoral researcher positions there was a sharp decrease in the percentage of

Figure 1: Gender profile of physics cost centres by group 2007/08

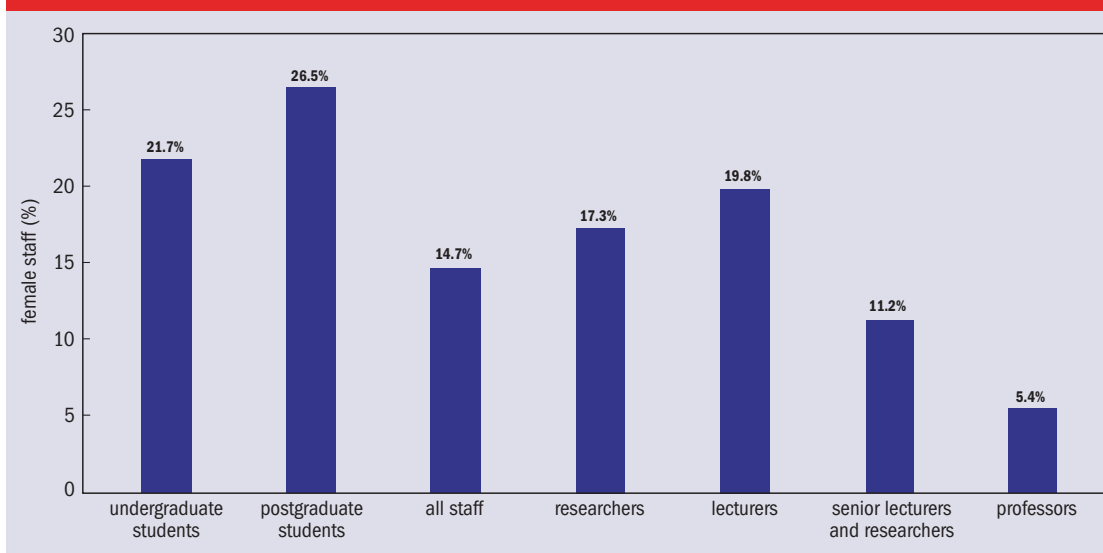
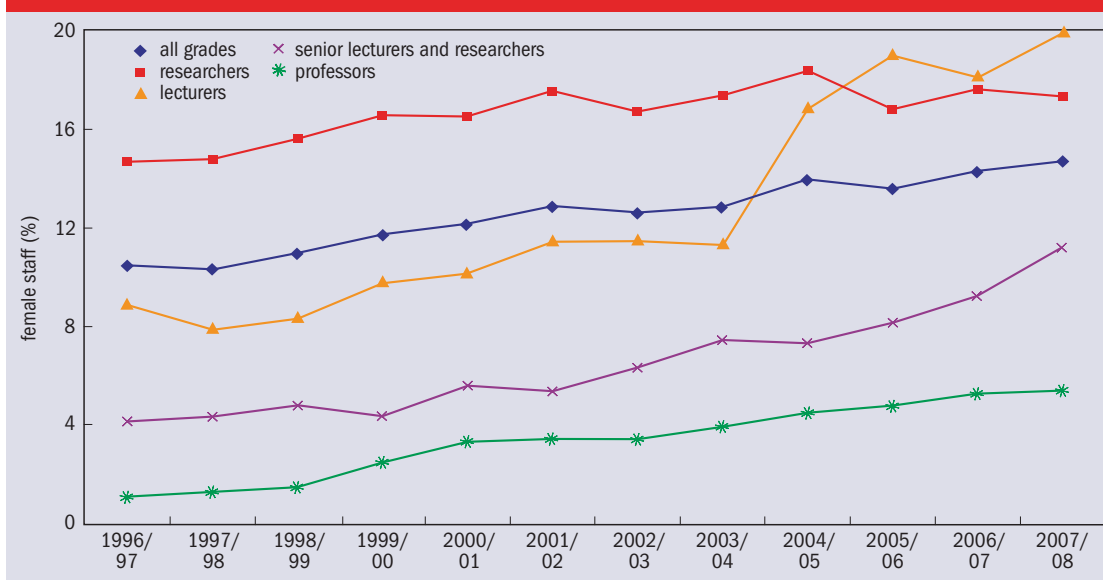
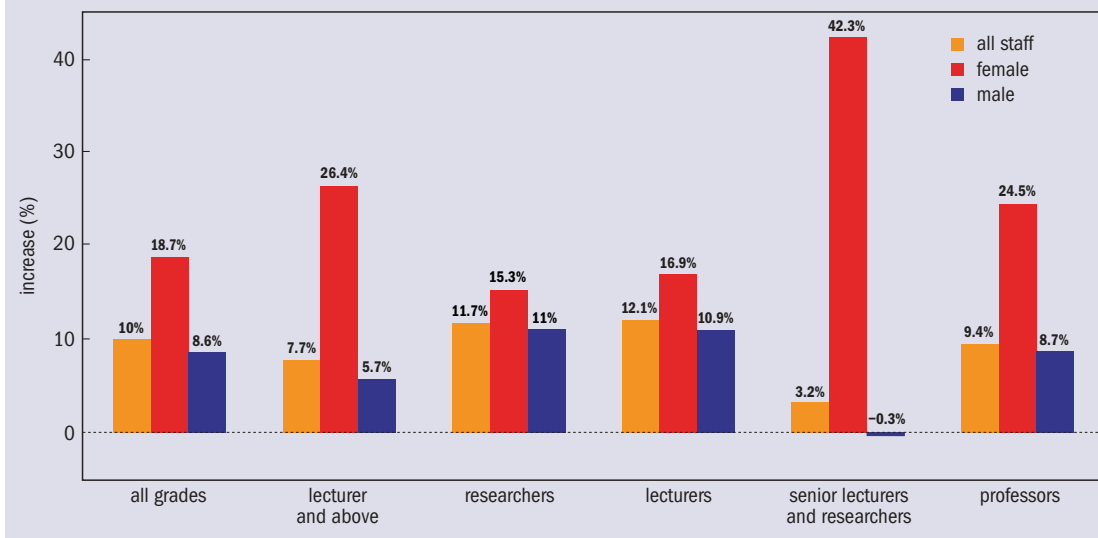


Figure 2: Trend in gender profile by percentage of women by individual grade group 1996/97 to 2007/08

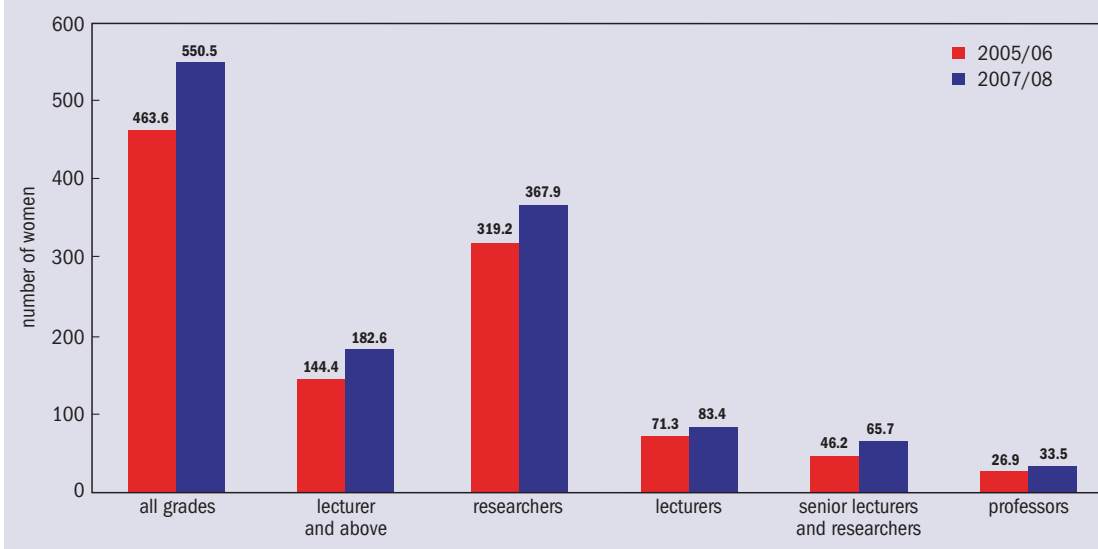


## 2: Gender profile of physics cost centres

**Figure 3: Percentage increase in staff numbers by gender and grade group from 2005/06 to 2007/08**



**Figure 4: Absolute number of female staff by grade group 2005/06 to 2007/08**



women, indicating that women were less likely than their male peers to continue their careers in physics cost centres.

The percentage of women across all grades has shown a steady increase over the last 11 years, with an average annual increase of about 0.4% (figure 2). The exception to this was researchers, who represented 56% of all female staff, and have exhibited the slowest rate of growth in percentage terms of female staff with an annual average increase of just 0.2%.

Since the previous digest the number of staff in

physics cost centres as a whole has grown by 10% (figure 3); there has been a growth in the overall population of female staff of 18.7% and a growth in the overall population of male staff of 8.6%. The percentage growth of female staff was higher than the percentage growth of male staff at every grade. There were notably larger increases at the two senior grades and particularly at senior lecturer grade although the baseline for these grades is still small compared to that for male staff. Figure 4 highlights the growth in absolute numbers of female staff between 2005/06 (the last digest) and 2007/08.

### 2.2: Gender profile at cost-centre level

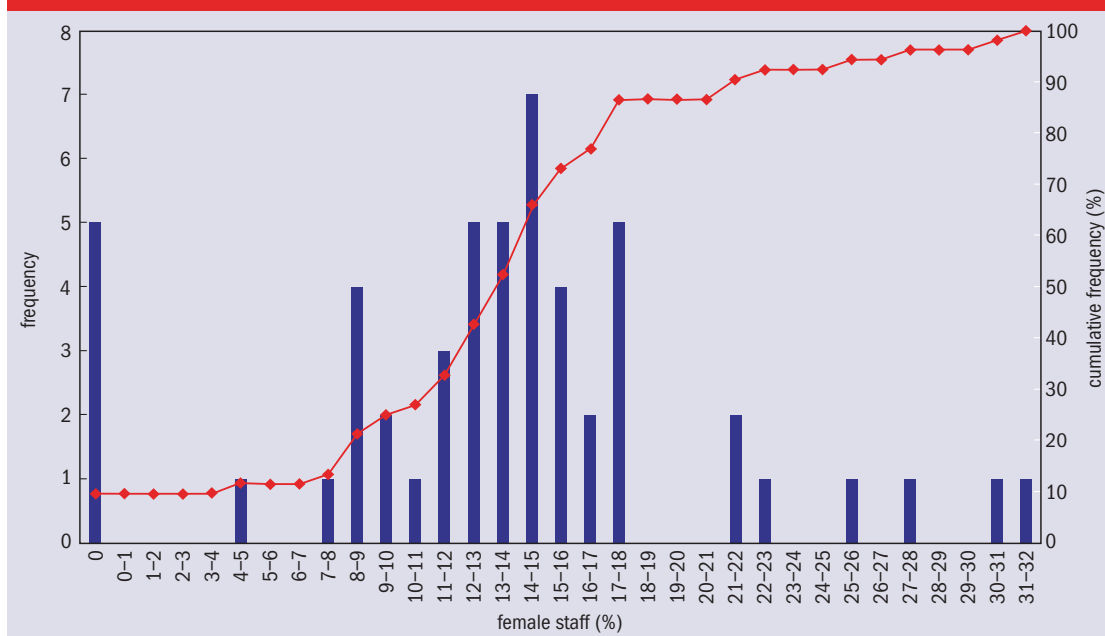
In 2007/08 five cost centres had no female academic staff from researcher through to professor grades (figure 5). These cost centres had between 0.5 and 29 staff in total. In comparison, seven cost centres had greater than 20% female staff and between them they accounted for almost a quarter (23.7%) of all female staff in physics cost centres.

An institution can compare the gender profile of their physics cost centre with other cost centres using figure 6. For example, a cost centre with 10% women across all academic grades had a percentage of women equal to or higher than 25% of cost centres. A cost centre with 15% women across all

academic grades had a percentage of women equal to or higher than 65% of cost centres. It should be noted that in a very small cost centre one woman could make a large difference in the percentage of women and, therefore, such percentages should be treated with caution.

Figure 7 provides an insight into how women were distributed across physics cost centres. There were 14/52 physics cost centres that had two or fewer female members of staff, compared with 10/52 cost centres that had greater than 15 female staff members. Taken together these 10 cost centres employed 48.2% of all academic staff, 55.6% of female staff and 46.9% of male staff.

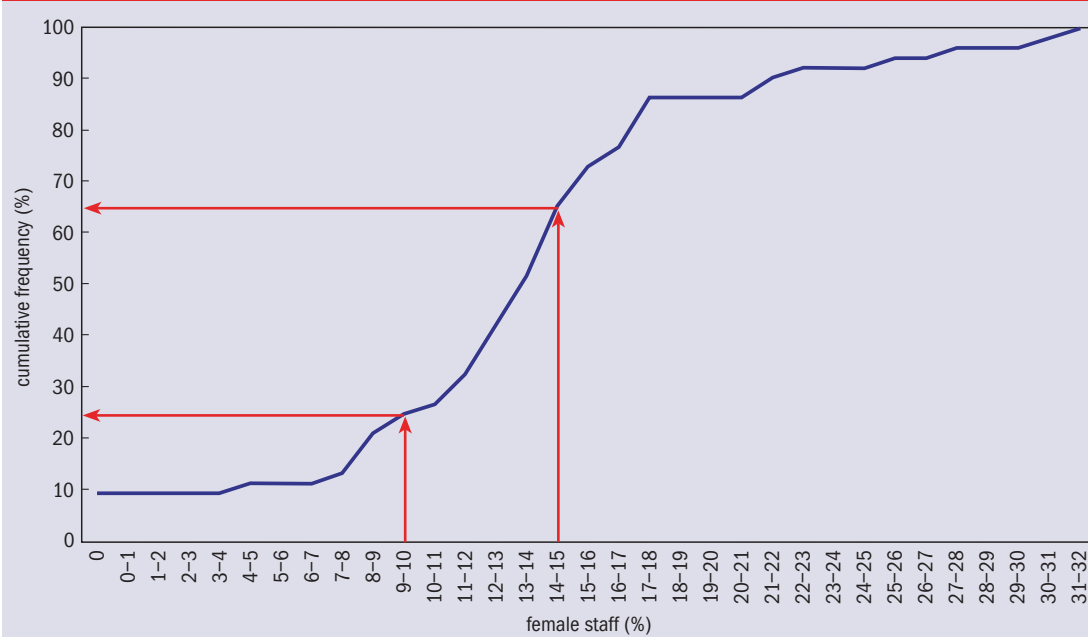
**Figure 5: Histogram and cumulative percentage frequency of the percentage of women in individual physics cost centres across all grade groups**



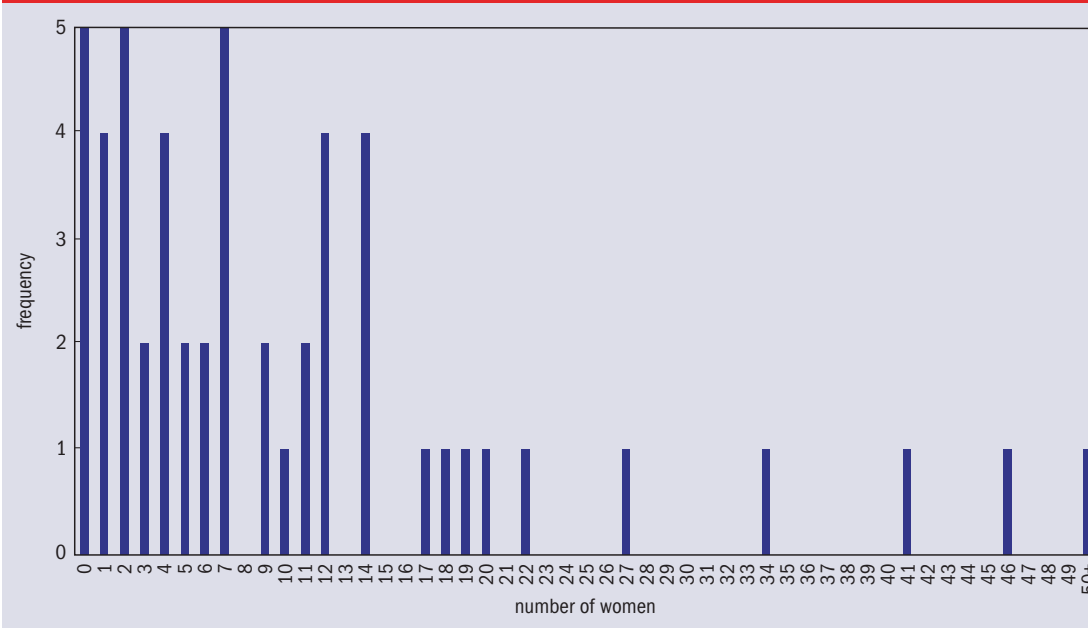


## 2: Gender profile of physics cost centres

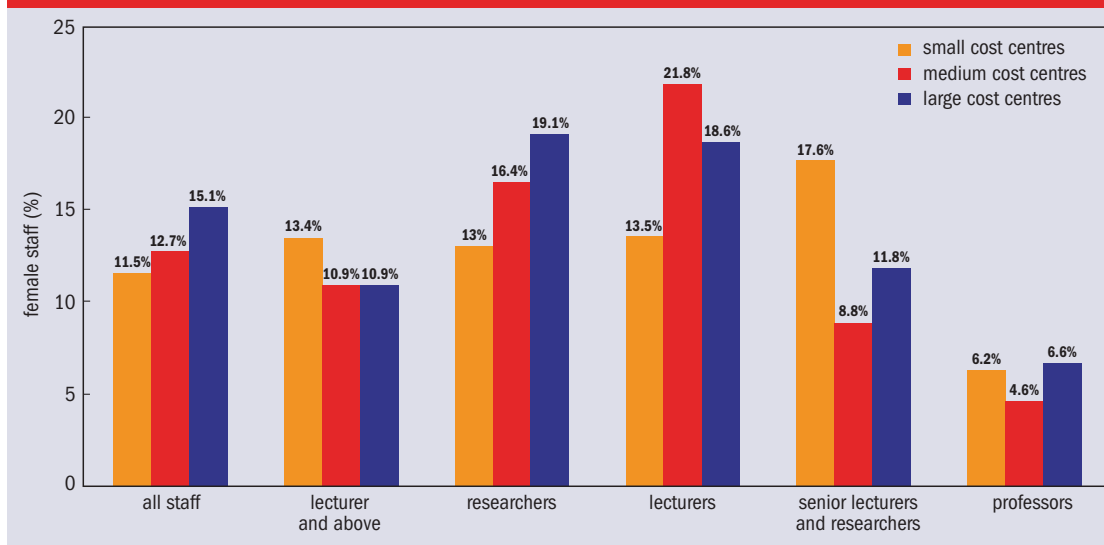
**Figure 6:** Comparing the representation of women with other cost centres



**Figure 7:** Histogram of the number of women in individual physics cost centres across all grade groups 2007/08



**Figure 8: Gender profile by grade group and size of cost centre 2007/08**



### 2.3 Gender profile by size of cost centre

For the analysis in figure 8, cost centres were split into three groups as follows:

- small cost centres: with 1–41 staff in researcher to professor grades (20 cost centres, representing 363 staff);
- medium cost centres: with 45–136 staff in researcher to professor grades (27 cost centres, representing 2341 staff);
- large cost centres: with 175–379 staff in researcher to professor grades (five cost centres, representing 1397 staff).

Due to changes in cost-centre size since the previous digest, direct comparisons could not be made, as some cost centres changed from small to medium and vice versa, as well as medium to large. However, general trends appeared to be that:

- the proportion of female lecturers in small cost centres has fallen from 16/100 (16%) in 2005/06 to 8/66 (13.5%) in 2007/08;
- the proportion of female senior lecturers has increased across all cost centres but the largest increase in percentage terms has been in small cost centres that employed 14/115 (12.2%) in 2005/06 and 17/95 (17.6%) in 2007/08;
- the proportion of female professors in small cost centres has increased from 2/92 (2.2%) to 4/56 (6.2%).

#### Small cost centres

Overall, small cost centres, which represent 8.9% of all physics staff, had disproportionately fewer numbers of female staff at more junior grades and

disproportionately higher numbers of female staff at more senior grades. They employed 4.6% of all researchers but only 3.4% of all female researchers, and 15.6% of all lecturers but only 10.6% of all female lecturers. When looking at more senior grades, however, they had a very large share of female senior lecturers (16.1% of all senior lecturers but 25.4% of all female senior lecturers) and a slightly larger share of female professors (9.0% of all professors but 10.5% of all female professors).

#### Medium cost centres

Medium cost centres employed 57.1% of all physics cost-centre staff and had the largest share of female lecturers, comprising 63.9% of all lecturers but 70.2% of all female lecturers. At higher grades, however, there were disproportionately fewer women; they employed 52% of all senior lecturers but only 41.1% of all female staff at this grade, and 59.5% of all professors but only 50.7% of all female professors.

#### Large cost centres

Large cost centres had only a very slightly larger share of female staff, comprising 34.1% of all staff but 36.6% of all female staff. This was predominantly from larger shares of female researchers (43.5% of all female researchers compared with 39.5% of all researchers) and female professors (38.8% all female professors compared with 31.5% of all professors). The five large cost centres had female representation in every grade group from researchers through to professors.

## 2: Gender profile of physics cost centres

### Staff grades across all cost centres

In terms of professors, there was at least one female professor in only 20 out of the 48 cost centres that employed professors. When this was broken down by size of cost centre, female professors were found in all five of the large cost centres; 11 in 27 of the medium cost centres; and just 4 in 16 small cost centres that employed professors.

At senior lecturer level, 11 small cost centres and 10 medium cost centres employed female senior lecturers where all cost centres had at least one male senior lecturer or researcher. Therefore half of all cost centres (26/52) employed female staff at the senior lecturer grade, compared to all cost centres employing male staff at this grade.

At the lecturer level, eight small cost centres and 23 medium cost centres had female lecturers. Overall, 36/52 cost centres had female lecturers; 49/52 had male lecturers.

And, finally, at the researcher grade all medium cost centres had at least one female researcher and eight small cost centres had female researchers; 44/52 cost centres employed at least one female researcher, compared with 48/52 that employed male researchers.

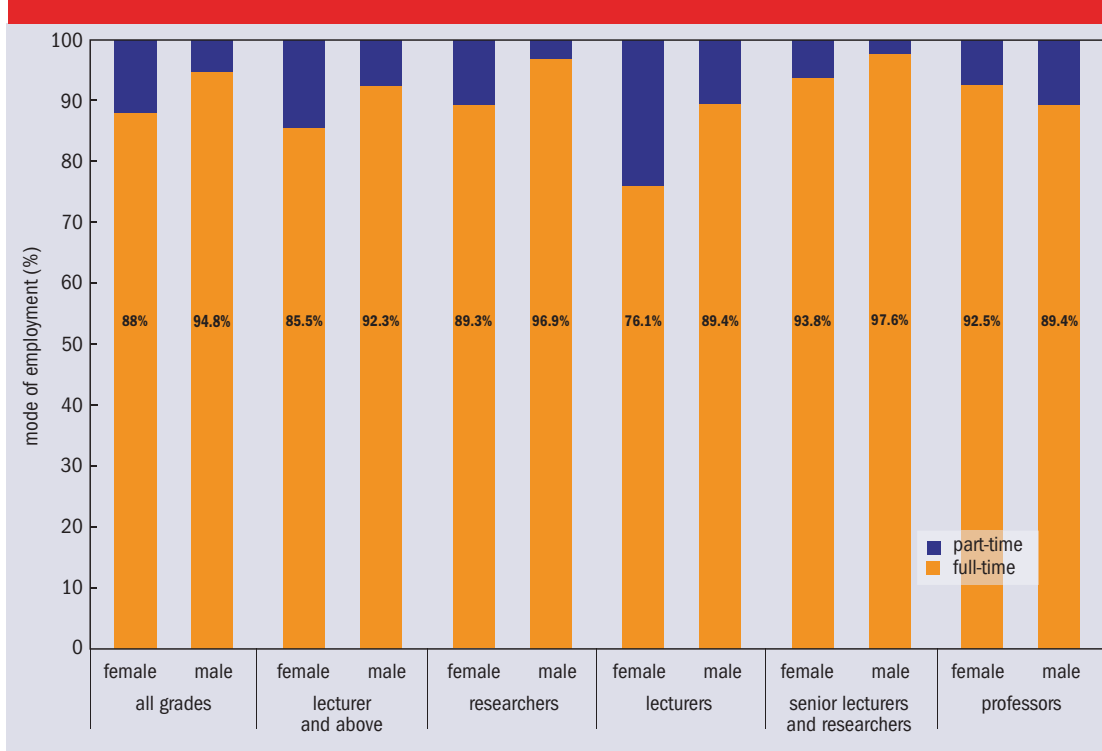
### 2.4 Gender profile by terms of employment

A higher percentage of female staff worked part-time at every grade level, with the exception of professors (figure 9), although the numbers of professors who worked part-time are comparatively low, so one member of staff could have a big effect on the percentage.

12% (66/550) of female staff in physics cost centres at all grades worked part-time compared with 5.2% (166/3203) of their male equivalents.

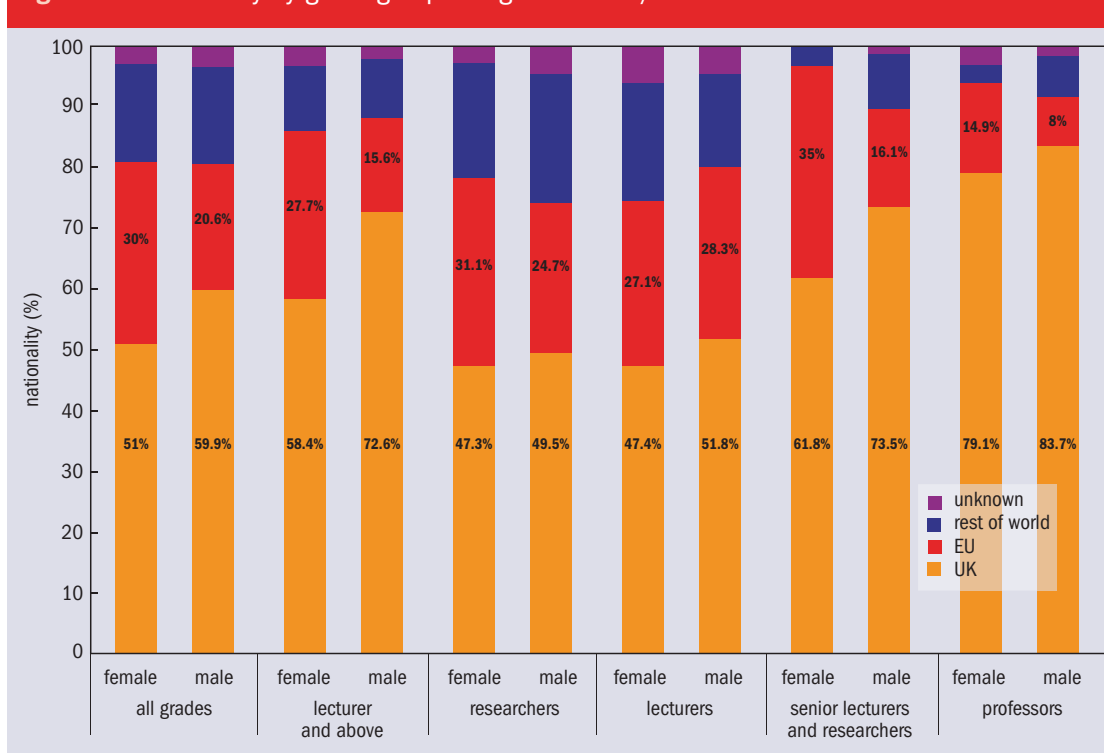
Very little substantive difference was found between the percentages of men and women who were on fixed-term contracts as opposed to open-ended contracts. The same was true when comparing the percentages of men and women by function of employment (research only, teaching only or teaching and research) for each grade group.

**Figure 9: Mode of employment by grade group and gender 2007/08**



## 3: Nationality of staff in physics cost centres

Figure 10: Nationality by grade group and gender 2007/08



2. HESA defines a UK national as someone from any part of the UK, including Guernsey, Jersey and the Isle of Man. Those from the Republic of Ireland are defined as being from the EU.

3. 2004 was the last significant expansion of the EU to include an additional 10 member states.

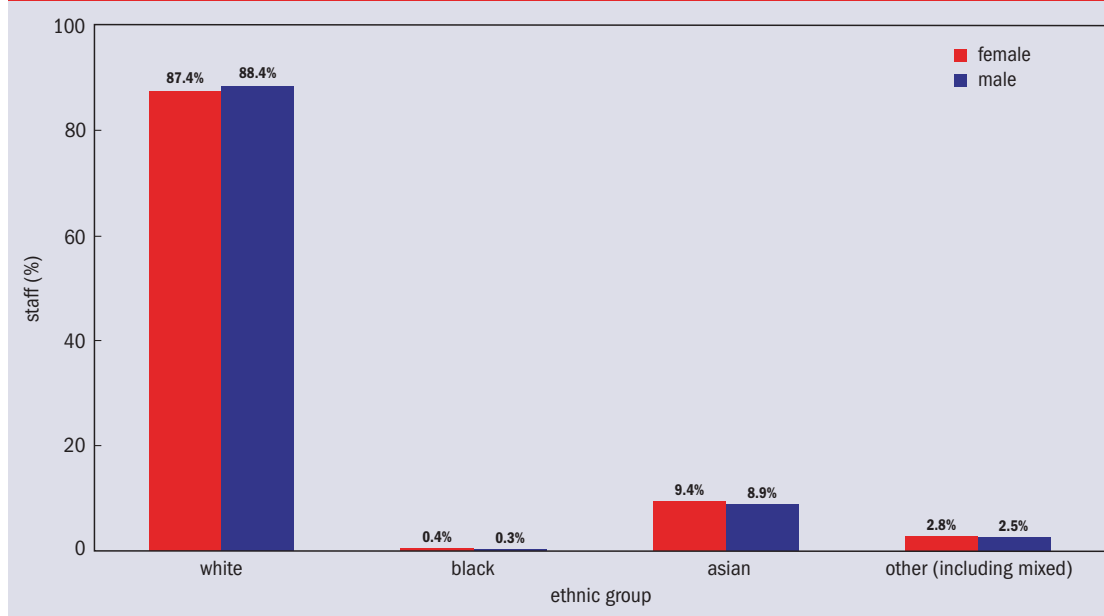
Across all grades, the majority of both male and female staff were UK nationals<sup>2</sup> (figure 10), although for female staff this was a slim majority at 51%. For both men and women the proportion of UK nationals rose as seniority rose.

The percentage of female academic staff from outside the UK across all grades was notably higher than for men, with the majority of these staff coming from the European Union (EU). This was particularly significant for senior lecturers, the grade that has seen the most rapid growth in percentage of female staff in recent years.

Using HESA data from 2004/05<sup>3</sup>, a comparison was made with the nationalities of female staff. Although the profile of staff, overall, was largely the same between 2004/05 and 2007/08 a major difference was found at the senior lecturer level, where the percentage of EU female staff had increased from 6/44 (13.7%) to 23/66 (35.0%), although absolute numbers remain comparatively small. The corresponding increase in male senior lecturers who were EU nationals was 51/555 (9.1%) to 84/521 (16.1%).

## 4: Ethnicity of staff in physics cost centres

**Figure 11:** Ethnic profile of academic staff across all grade groups by gender 2007/08



Figures exclude staff whose ethnicity is unknown.

The ethnicity of all academic staff in physics cost centres was broadly the same for both men and women. The majority of staff (over 88%) identified themselves as white<sup>4</sup> (figure 11). This excludes physics staff for whom ethnicity was unknown, which amounted to 13.3% of the population.

Once UK nationals were considered in isolation, the proportion of those identifying as white rose

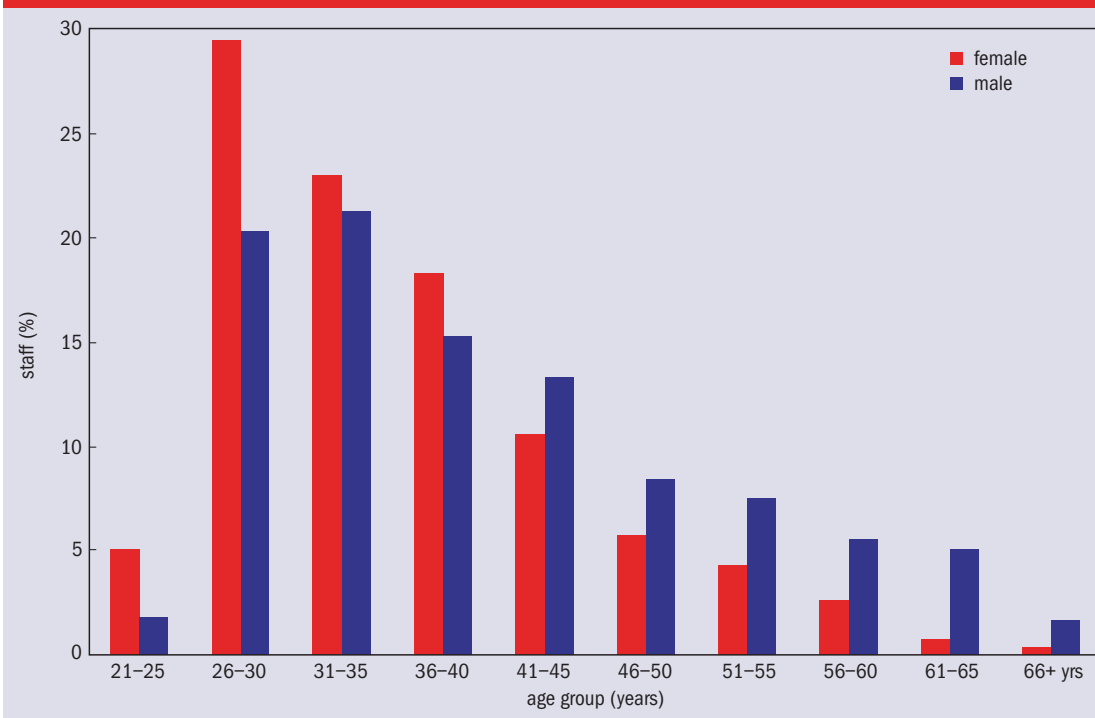
to 93% and 94% for women and men respectively.

In general, there has been a complex picture of retention and attrition among different ethnic groups in physics, from A-level through to undergraduate and postgraduate levels. The Institute, together with the Royal Society of Chemistry, has published research in this area, details of which can be found in the bibliography (p15).

**4.** HESA data is in broad ethnicity groupings as the numbers of staff in some groups are too small for meaningful analysis.

## 5: Age profile of staff in physics cost centres

**Figure 12:** Age profile of all male and all female academic staff across all grade groups 2007/08



5. Reproduced from *Survey of Academic Appointments in Physics 2004–2008*, Institute of Physics.

The percentages of all female and male staff distributed across the age spectrum shows that the physics community was skewed towards younger age groups (figure 12). Women generally had a younger age profile than men, with the median age for women being 36.2 years and the median age for men being 40.6 years.

From the IOP report *Survey of Academic Appointments in Physics, 2004–2008*, the average age for appointment to lecturer grade was 34 for women and men. However, for both of the senior grades the average age of appointment was higher for women than it is for men, by 3.4 years for senior lecturers and by four years for professors. Over the survey period female staff made up 17% (87/499) of staff arrivals, with the highest proportion of female arrivals at lecturer level, where women accounted for 51/174 (23%) of all arriving lecturers.

**Table 1:** Average age on arrival by academic grade<sup>5</sup>

Grade	Average age on arrival	
	M	F
Professor	46.5	50.5
Reader and senior lecturer	38.0	41.4
Lecturer	34.2	34.1
Experimental officer	35.7	33.0
Research fellow*	33.2	34.1
Other (temp. acad. staff, university teacher [non-research], etc)	28.0	28.0

\* Research fellow is a researcher holding a personal fellowship, which is different from the HESA-defined grade group of researcher.

## 6: Other diversity profiles in physics cost centres

### 6.1 Disability

From the HESA 2007/08 data, 1.2% of all academic staff in physics cost centres declared that they had a disability. This was lower than the estimated employed population of the UK (5%)<sup>6</sup>, and lower still than the percentage for academic staff across all subjects (2.3%) and across all SET subjects (1.9%).

### 6.2 Sexual orientation

HESA does not collect data on the sexual orientation of staff, and few data exist in society more generally. Government statistics suggest that 6% of the general population are lesbian, gay or bisexual (LGB). Currently approximately 20 higher education institutions are thought to seek information regularly on the sexual orientation of their staff.

<sup>6</sup> *Labour Force Survey, 2007.*

## 7: Concluding remarks

This is the first time that the Institute has systematically collected and analysed data on all diversity dimensions and it is hoped that this publication will be produced every 2–3 years. The picture at present is one of a not particularly diverse profile of staff in physics cost centres, with the majority of staff being white and non-disabled, and predominantly male.

However, the percentage of women across all grades in physics cost centres has shown a steady increase over the last decade, with particular growth at lecturer and senior lecturer level. The exception to this is researchers, which have shown little or no growth. There are disproportionately higher numbers of women studying postgraduate physics but these women are not then moving on to academic researcher grades in the same numbers. There is a clear attrition point between postgraduate study and researcher, and the Institute may in the future, wish to investigate this issue further.

Since the previous digest the percentage growth of female staff has been higher than the percentage growth of male staff at every grade with notably larger increases at the two senior grades and particularly at senior lecturer grade. However, there is a continuing lack of visible senior female role models across small and medium physics cost centres. The absence of role models for females in the earlier stages of their career may then have a significant impact on their future career.

The Institute's Project Juno and the Athena SWAN Charter recognise and reward university physics

departments that can demonstrate that they have taken action to address the under-representation of women in university physics and have put in place practices for the benefit of both men and women. For example, a Juno Champion department is expected to demonstrate fair and transparent recruitment, annual review and development, and promotions processes for all staff, including researchers.

The majority of male and female staff were UK nationals and, for both men and women, the proportion of UK nationals rose as seniority rose. However, the percentage of female academic staff from outside the UK across all grades was notably higher than for men, with the majority of these staff coming from the EU. This was particularly significant for senior lecturers, the grade that has seen the most rapid growth in percentage of female staff in recent years.

The ethnicity of all academic staff in physics cost centres was broadly the same for both men and women with the majority of staff (over 88%) identifying themselves as white. Women generally had a younger age profile than men, with the median age for women being 36.2 years and the median age for men being 40.6 years. The majority of staff declared themselves as non-disabled, as only 1.2% of all academic staff in physics cost centres declared that they had a disability.

The Institute will continue to work to promote all strands of diversity across physics, to increase the representation of all under-represented groups.



## 8: Bibliography

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# Diversity in University Physics

## Statistical Digest 2010

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