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Role of Astronomy in Research funding of UK Physics Departments

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In this note we have evaluated the dependence of UK Physics departments on astronomy research funding, with a view to demonstrating the vulnerability of some Physics departments to any downturn in astronomy funding. This was stimulated by the PPARC announcement in March 2006 of a list of major astronomy projects that faced closure because of a downturn in core astronomy funding in the current financial year. While some items in the list could be classified as older facilities making way for new ones, several represented areas with great potential for the future.

The attached table lists UK Physics departments in order of their total research funding from PPARC and EPSRC as of December 2006. From the recent funding model tables supplied by HEFCE we have extracted the four-year average for the percentage of total research income that comes from Research Councils. Using this and the separate figures provided by PPARC for astronomy and particle physics funding, we have estimated for each university the percentage of their total research income that comes from astronomy. Approximately 25% of the total research income of UK Physics departments currently comes from PPARC astronomy funding.

We identified 40 universities as having made an entry under UOA19 (Physics) in RAE2000. In addition Portsmouth have started a new Astrophysics group since 2000. 34 of these 41 universities receive at least some astronomy research funding. This represents a doubling of the number of Physics departments with astronomy activity over the past 20 years. The reason for this expansion of astronomy groups is simply a response to falling student numbers in Physics. Astronomy is a crucial attractor of students into university Physics departments.

To highlight the dependence of Physics departments on astronomy research funding we have shown in bold in column 6 of the table those departments where more than 40% of their total research funding from all sources (including Government Departments, industry, charities and the EU as well as from Research Councils) comes from PPARC astronomy funding. There are 11 such departments, with a further two having percentages of 38 and 39%. Some of these departments may experience financial difficulties if the downturn in core astronomy funding experienced in the current financial year continues through the next CSR period. Of

the 9 departments with total PPARC+EPSRC research funding of less than £2.5m, 4 receive more than 40% of their total research funding from astronomy (with a fifth on 38%).

In conclusion 83% of UK Physics departments receive astronomy research funding and 30% of them can be characterized as being quite strongly dependent on such funding.

Role of Astronomy in Research funding of UK Physics Departments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	University (in order of total PPARC +EPSRC funding)	total PPARC +EPSRC funding (£m)	RAE	% of total research funding from PPARC+ EPSRC	% of total research funding from astro	part. phys.	astro +part. phys. (PPARC)	EPSRC
1.	Cambridge	50.8	5*	68	33	3	36	32
2.	Imperial	46.9	5*	86	21	25	46	40
3.	Oxford	43.4	5*	83	20	8	28	55
4.	UCL	39.2	5	79	41	6	47	32
5.	Manchester	38.1	5	93	46	5	51	42
6.	Edinburgh	29.5	5	-	(15	4	19	81)
7.	Durham	28.9	5	81	27	30	57	24
8.	St Andrews	24.5	5	-	(15	0	15	85)
9.	Queen Mary	21.4	5	90	62	24	86	4
10.	Warwick	20.5	5	81	4	3	7	74
11.	Leicester	18.8	5	94	87	2	89	5
12.	Strathclyde	16.5	4	-	(1	0	1	99)
13.	Nottingham	15.1	5	70	4	3	7	63
14.	Heriot-Watt	14.5		-	1	0	1	99)
15.	Birmingham	13.9	5	82	29	1	30	52
16.	QU Belfast	13.7	5	-	(22	1	23	77)
17.	Leeds	13.5	5	67	10	0	10	57
18.	Sheffield	12.4	5	30	10	1	11	19
19.	Southampton	11.9	5*	81	20	7	27	53
20.	Lancaster	11.7	5*	87	39	33	72	15
21.	Bristol	9.9	5	80	4	0	4	76
22.	Cardiff	9.1	5	-	(83	0	83	17)
23.	Glasgow	8.9	5	-	(24	10	34	66)
24.	Surrey	6.4	5	73	0	0	0	73
25.	Bath	6.1	4	69	7	0	7	62
26.	Open Univ	5.6	3a	48	42	0	42	6
27.	Exeter	5.3	5	71	25	0	25	48
28.	York	3.7	4	90	0	0	0	90
29.	Sussex	3.3	5	89	53	17	70	19
30.	Holloway	3.2	5	91	0	0	0	91
31.	Keele	3.2	3a	71	22	0	22	49
32.	Kent	2.7	3a	79	15	0	15	64
33.	Hertfordshire	2.3	4	51	38	0	38	13
34.	Reading	2.3	4	61	0	0	0	61 (closing)

35.	Liverpool JM	2.3	4	47	47	0	0	0
36.	Aberystwyth	2.0	5	-	(44	0	44	56)
37.	Newcastle	1.5	4	51	0	0	0	100
38.	Kings	1.4	4	43	0	17	17	26
39.	Loughborough	1.3	4	32	0	0	0	32
40.	Portsmouth	1.0	-	-	(89	11	100	0)
41.	Central Lancs	0.5	4	43	43	0	43	0

Notes:

- (1) Column 2 gives the university name; column 3 gives the total funding in £m received from PPARC+EPSRC; column 4 gives the RAE2000 grade for Physics; column 5 gives the percentage of total research income received from Research Councils; columns 6-9 give the percentages of total research income received from PPARC astronomy, PPARC particle physics, PPARC total and EPSRC, respectively.
- (2) All universities in the UK making an RAE submission in 2000 under UOA19 (Physics), plus Portsmouth, which has started an Astrophysics group since 2000, are listed here. Universities are listed in order of their total 2006 research funding from PPARC and EPSRC. 34 out of 41 receive PPARC astronomy funding.
- (3) Research funding totals for December 2006 were supplied by PPARC and EPSRC (may include some funding to non-Physics departments, e.g. Earth Sciences, Applied Mathematics). PPARC supplied separate figures for astronomy and particle physics.
- (4) The percentage of total research funding which comes from Research Councils (4-yr average) was taken from HEFCE funding model tables (may include some income from NERC). These percentages were used in calculating columns 6-9. Other sources of research funding include charities, the EU, Government departments, industry and overseas countries. These HEFCE tables give data only for English universities. The median percentage is 80. PPARC astronomy funding accounts for about 25% of the total Physics research income of UK universities.
- (5) Bold figures in column 6, the percentage of total research income from PPARC astronomy funding, indicate those 11 Physics departments which receive more than 40% of their total research funding from PPARC astronomy funding. 4 of the 9 departments with total research income less than £2.5m fall into this category. Figures in brackets indicate those universities for which we do not have data for column 5.