

United Kingdom: Extracts from the Annual Report for 1987–88 of the Science and Engineering Research Council

The 1987–88 Annual Report of the Science and Engineering Research Council reviews the wide spectrum of research funded by the Council. This ranges from basic science, where the eventual application is unpredictable, to strategic research in science and technology which in the medium term offers the potential benefit of wealth creation.

During the year, SERC support for science and engineering amounted to £357 million, shared by the four Board areas as follows:

Astronomy and Planetary

Science Board:	£54.5	(15%)	(millions)
Engineering Board:	£98.9	(28%)	
Nuclear Physics Board:	£82.1	(23%)	
Science Board:	£91.3	(25%)	

Centrally supported activities (£ 16.8 million) and administration (£ 13.8 million) accounted for the remaining 9% of the funds.

Distribution of the actual expenditure for 1987–88 and the proposed expenditure for 1991–92 by category:

	87–88	91–92
Grants	33.5%	39.1%
Studentships and fellowships	15.4%	16.8%
Central facilities	26.8%	20.3%
International subscriptions	24.3%	23.8%
Distribution by Boards:		
Astronomy and Planetary Science	15.2%	16.7%
Engineering	27.7%	29.5%
Nuclear Physics	23.0%	16.8%
Science	25.5%	29.6%

The report presents eleven review articles which highlight some of the major advances in recent years resulting from projects supported by the SERC.

The revolution in high temperature superconductivity: The history and implications for science of the recent discovery of new superconductors which has led to an explosion of activity in high temperature superconductivity (A. D. Caplin and I. F. Corbett).

The production of man-made molecules: Studies of nature's complex molecules and the potential for man to prepare new pharmaceuticals, agrichemicals, fragrances, flavours and so on, using an enzyme-catalyzed process in the key step of a synthetic sequence (S. M. Roberts).

Understanding and controlling biological systems: Research into molecules which could lead to better management of processes such as initiation, growth, mutation, and duration of the life span of living organisms (C. H. Hassall).

Asymmetry between matter and antimatter: Review of new research on the slight asymmetry between matter and antimatter (D. J. Candlin and K. Peach).

Communications engineering: A review of communications engineering research in the context of an industry expected to grow rapidly with wider liberalization of telecommunications data processing and audio-visual media (P. G. Farrell).

Analysing how we see: Research to analyse how the brain interprets images with a view to the possible development of mechanical systems for applications such as industrial assembly, vehicle guidance, and medical analysis of images (D. E. Broadbent).

Developments in parallel computing: A review of the exciting potential of parallel computing developments which are expected to lead to dramatic increases in the speed of computer systems and offer the capability of solving computationally intensive problems (D. J. Wallace).

Advances in particulate technology: Particulate technology spans a wide range of commercially important materials, from ceramics and polymers to agrichemicals and aerosols, from foodstuffs and pharmaceuticals to sand and cement. This article reviews research activity aimed at improving design and operating practices by engineers.

The longest-lived astronomical satellite: The history and highlights of the International Ultraviolet Explorer Satellite launched over ten years ago and still operating 24 hours a day (R. Wilson).

Probing nuclear molecules: Experimental work at the Nuclear Structure Facility at Daresbury Laboratory has been uncovering an alternative to the conventional picture of the nucleus which, in some cases, may look more like a molecule.

Death of a massive star: Studies by astronomers and particle physicists of a supernova explosion observed in February 1987 in the galaxy nearest to our own (T. W. Jones and P. G. Murdin).

Studentships, fellowships and research grants

A significant element of the Council's international activities is the support it gives through its studentships, fellowships and research grants. These are relatively modest in cost but can be the key to increasing mobility and collaboration across the range of science and engineering for which the Council is responsible. There is no geographical limit to the countries which can be involved in these low cost exchanges. More than 100 students and fellows can be supported in any one year in full-time study in overseas countries (about half of these are in NATO countries and funded through the UK's participation in the NATO Science Programme which is administered in the UK by SERC) and more than eight times this number are supported for short study visits overseas. This represents nearly 10% of the total number of students and fellows supported in a year. The Council also

awards some 2300 research grants each year to fund the costs of specific research projects in UK academic institutions. More than 400 of these will include modest provision for overseas travel or will fund visiting fellows from overseas. Thus about one-sixth of the research groups receiving SERC research grant support have the opportunity to work in association with researchers in other countries.

Studentships in 1987–88

In 1987 the Boards and Directorates allocated 4910 studentships (compared with 4945 in 1986). Of these, 1705 lay within the field of information technology. The industry-linked Cooperative Awards in Science and Engineering (CASE) scheme had 849 research studentships allocated to it. By 1 November 1987, a total of 4700 awards had been taken up. The number of nominations for CASE was disappointing in most areas, but especially so in engineering where take-up by 1 November 1987 of 149 fell some 35% short of target. In contrast, the information technology conversion courses, launched in 1983, have been most successful in providing a fresh supply of trained manpower during a period of undersupply from customary undergraduate channels. About 45% of the Council's advanced course awards fell into this category (see table below).

There has been one notable addition to the training scene. In compliance with European Community legislation, eligibility for awards was extended in 1987 to those candidates who were nationals of other member states of the European Community and who at the date of application were ordinarily resident in the Community. Awards to these candidates are, however, only required

to provide tuition fees. There were 54 awards falling into this category.

Fellowships in 1987–88

Senior fellowships are intended to allow full-time personal research and scholarship by academic engineers and scientists for periods of up to five years. Demand for senior fellowships was much higher in 1987–88, with 23 applications compared with 11 for 1986–87.

Advanced fellowships are intended to support young researchers with at least two years' postgraduate experience and who are seen as well qualified for academic careers but for whom permanent posts in academic institutions are not yet available. In 1987–88, 18 such awards were made. Demand remains high with 68 eligible applications received in 1987–88 of which 30 were considered to be fully of the quality expected of advanced fellows. The demand for *postdoctoral fellowships* was lower this year with 172 (227 in 1987) applications for the 65 awards available for tenure in the United Kingdom and overseas (outside Europe). Of the 62 awards offered, 31 were designated NATO fellowships because of the annual subvention received from NATO to support United Kingdom participation in the NATO Science Fellowships Programme, for which the SERC is the national administrator. Nine awards were made available to the Royal Society for Western Europe through its International Exchange Scheme, two to the Natural Environment Research Council, and ten in Information Technology (outside the main competition for postdoctoral awards).

The full Annual Report of the SERC for 1987–88 is available from the Public Relations Unit, Polaris House, North Star Avenue, Swindon, Wiltshire SN2 1ET, U.K.

	Research studentships	CASE	Advanced studentships	Total
Astronomy and Planetary Science	73	7	21	101
Engineering	296	149	5506	951
Nuclear Physics	57	8	—	65
Science	1021	402	324	1747
Biotechnology	35	43	21	99
Information Technology	316	112	1288	1716
Totals	1798	721	2160	4700