Science & Technology Facilities Council

Report of the Grant Funding Mechanism Review Panel

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Contents

Executive Summary

1. Between May and September 2010 STFC reviewed its mechanisms for funding the exploitation of facilities and experiments in particle physics, astronomy, space and nuclear physics (including associated theoretical activity) in universities and other research groups. The Review aimed to make recommendations to the STFC Executive on any changes needed to ensure that the support is provided in an optimal way.

2. The Review Panel considered information on a number of potential grant funding mechanisms; current distribution of STFC grant funding and other recent relevant reviews. The Grants Panels and STFC Programme Managers were invited to give feedback on the strengths and weaknesses of the current grants system. The Panel then developed a number of options for future mechanisms and invited the community to comment on these. 85 individual and group responses to this consultation were received, covering all subject areas and group sizes. The inputs reflected a wide range of (often conflicting) views on the best approach.

3. The Panel considered that one size did not fit all in terms of grant funding mechanisms, and that whilst the overall principles should be the same, the detailed implementation of any system would probably need to be different across the communities supported by STFC. It was agreed that the quality of peer review should not be compromised, whichever funding mechanism was adopted.

4. The Panel agreed that it was important to be able to provide stable, longer-term support for research groups where needed due to the typically long timescales in experimental projects. Longer term grants offer flexibility in the use of resources, allow researchers to tackle long-term problems and enable groups to leverage other resources from the universities, including additional posts. However, it was also noted that the current 5 year rolling grant limits financial flexibility in a static or decreasing budget and that, as a consequence, support beyond year 3 was often strongly tapered and seldom guaranteed. This compromised the ability of groups to plan their research on a stable, long-term basis.

5. The Panel considered the information provided and the consultation responses and developed a number of recommendations. The Panel recommends that the existing standard and rolling grant mechanisms are replaced by a single consolidated grant scheme containing core and non-core staff post funding. Core staff posts would be those key posts identified by the grants panel as being crucial for long term support of research activities.

6. The main features would be:
    a. One consolidated proposal per department (or equivalent) per subject area submitted every 3 years;
    b. Core staff posts could be funded up to 4 years, non core staff posts up to 3 years (but with flexibility to spend over 4 years using the existing rules for applying for a grant extension);
    c. A mechanism to transit to this scheme to provide planning certainty for groups is proposed;
    d. The part of the budget to be allocated to core staff posts to be determined by the Grant Panel and STFC;

e. Core staff can support construction projects mainly funded by project grants;
f. Consolidated grants would incorporate existing schemes for PATT, travel and visitor grants;
g. Where appropriate, encouragement could be given to groups from different institutions to apply for a single consolidated grant in the same well defined research area.
h. Greater flexibility should be permitted on consolidated grants to allow staff to move between projects over the course of a grant, particularly to start new activities before the next application is submitted.
i. An individual academic can only be supported for exploitation on a maximum of one consolidated grant;

7. It is expected that adoption of this scheme will reduce the number of grant applications submitted over 3 years from ~600 to ~110, though clearly the complexity of individual proposals will increase.

8. The Panel recommends that the Project Research and Development (PRD) Scheme remain separate from the consolidated grant scheme. The Review recommends that a certain level of public outreach activity is funded through the consolidated grant, subject to peer review.

9. The Panel recommended that although there would be no other research grant schemes for exploitation and theory (other than the Astronomy project grants that include operation costs), specific calls for proposals could be held where, for example, a new large facility or experiment comes on line.

10. The Review Panel identified a number of other issues during the Review. The Panel recommends that a working group be established to look into ways of making the peer-review system simpler and more administratively efficient whilst not compromising its rigour and identified specific areas for consideration The Panel recommends that the Projects Peer Review Panel and the Grants Panels should develop improved linkages. In response to concerns about the operation of fEC, it is recommended that the Grants Panels need to strike an appropriate balance between the funding of academic fEC and postdoctoral positions. The Grants Panels and applicants appeared to be unsure about the criteria for funding studentships The Grants Panels should be provided with improved guidance about the criteria for funding studentships on research grants. Finally, two other related issues were identified by the Panel, which whilst not within the scope of the review, required urgent consideration by STFC. These were (i) the balance of funding between exploitation/theory grants and the construction of and access to facilities, and (ii) the apparent disparity in the cost of funding STFC staff and university academics through the Grant Panels.

Introduction

11. This paper reports on a review of STFC's delivery of its support for the exploitation of current facilities and experiments in universities and other research groups, which included the associated theoretical activity but excluded post launch support for space missions. The purpose of the review was to recommend, to the STFC Executive, an optimal way for STFC to provide support for science exploitation in universities and other research groups, currently served by research grants, and internal funding at STFC laboratories. To undertake the review, a Panel was established chaired by Professor James Stirling, University of Cambridge (see Annex 1). Panel Members were selected to provide representation from the STFC Advisory Committees, Grants Panels and grant holders across the range of STFC funded science. The review was undertaken between May and September 2010.

12. The reasons why the review was initiated were:
    - One of the key priorities in the Strategic Plan being developed to deliver STFC's Vision is to assess and review the use of funding mechanisms to ensure that research support aligned with STFC's strategic goals, maintaining expertise where appropriate;
    - Advice received from BIS was that the UK's world class research base should be sustained by continuing to focus on excellence, concentrating research funding, where needed, to secure critical mass and impact;
    - The ongoing need to ensure that STFC's research grant funding and delivery mechanisms are fit for purpose;
    - The likely continued pressure on funding and the need to balance support for long term programmes with the need to retain funding flexibility.
    - The introduction of the Shared Service Centre Grants Service and the implementation of a new cross-Council grants system, in particular the fact that the new system will not support some of the complexities of the current rolling grant mechanism.

13. In addition, as the review got underway, Government statements were issued on the need to significantly reduce administration costs in the public sector.

14. This report presents the findings and recommendations of the Review Panel for STFC Executive consideration.

Scope of the Review

15. The Panel agreed that the main focus of the review should be on the funding mechanisms for the c. £82M (in FY09/10) currently being spent via grants and STFC laboratory funding through the Particle Physics, Astronomy and Nuclear Physics Grants Panels.

16. From the outset, the Panel agreed that it would not come to the review with any particular "preferred" solution, but instead would consider, from first principles, the most appropriate mechanisms to deliver research resource to universities and research institutions while meeting, as far as possible, the requirements of an "ideal mechanism" that:
    - recognised and rewarded science excellence;
    - focussed upon STFC's strategic priorities;
    - allowed the focussing of support to secure critical mass and impact;
    - had the flexibility to respond to different needs;
    - met the desire to exploit current and past investment in facilities and experiments;
    - addressed the need to provide access to key skills and capabilities;
    - fostered education and training;
    - delivered pathways to impact, trackable outcomes, and fostered technology development, where appropriate;
    - delivered administrative and managerial efficiency, particularly in terms of the assessment procedure, producing funding decisions in a timely manner, and balancing the need for rigorous peer-review assessment of proposals with the desire not to impose an undue burden on applicants, reviewers or the office;
    - provided appropriate stability of support to allow long term research projects.

17. The Panel also assumed that the peer review of construction projects would still be undertaken by PPRP, on behalf of PPAN, as it was able to review across the STFC portfolio using standard assessment criteria. As currently, and where appropriate, such construction projects could be funded for longer than three years to provide a degree of confidence for international partners and planning certainty for the UK groups. It was noted that the review point for such projects would be the triennial Programmatic Review, where the continued strategic priority of all construction projects would be tensioned against each other and exploitation activities, as at present. However, the Panel would need to consider the support of construction projects on Rolling Grants as currently occurs for Particle Physics.

18. The review did not address the issue of the balance of funding between exploitation and theory grants verses the construction of facilities. While this had a major impact on grants budgets and hence the balance between long-term commitment and flexibility, it was considered not appropriate for this review as it was a strategic issue for Council, Science Board and PPAN. However the Panel agreed this was an issue that needed to be urgently addressed by these bodies.

19. It was also acknowledged that the outcome of the review would need to be mindful of the recent Government statements on the need to significantly reduce administration costs in the public sector and that it was unlikely that STFC would be able to implement an option that required increased administration effort.

20. The review would consider the coordination of decisions on funding projects and their subsequent exploitation. This would be especially important for space projects following the creation of the UK Space Agency. Any options recommended by the Panel should not make the "dual-key" (coordination of project and exploitation funding between STFC and the UKSA) impossible to implement. Consideration would also be given to flexibility in the use of resources on exploitation grants to get new projects off the ground.

21. The review would be mindful of the move to increased cross-Council harmonisation of grants processes associated with implementation of the Shared Service Centre, but this would not necessarily be a barrier to recommending any particular option.

Methodology

22. Prior to the first meeting of the Review Panel on 18th May 2010, the Project Manager conducted a survey of relevant grants funding mechanisms in other Research Councils and the results were made available to Panel members. Of particular interest to the Panel were schemes providing a level of longer-term funding for key "core" staff, i.e. those forming a necessary part of the long-term infrastructure and capability needed to undertake new projects, including technicians, engineers, IT and administrative staff.

23. Data were also provided for the Panel on the current distribution of funding between institutes and committed/uncommitted funding (see Annex 2), together with copies of other relevant reviews, e.g. RCUK review of peer review efficiency and effectiveness and the EPSRC review of its Platform Grant scheme.

24. After the first Panel meeting, Professor Stirling briefed the Grants Panel Chairs on the Review Panel's discussions to date and invited them to consult with their Panels to provide input into the review in terms of what they saw as the strengths and weaknesses of the current mechanisms. STFC Programme Managers were also invited to provide similar input.

25. The responses received from all parties were discussed at the second meeting of the Review Panel on 25th June 2010 and they later informed discussion on possible options for future mechanisms. Three possible options, which included several variations, were identified. These were:

    Option 1 - 3-year standard grants
    Option 2 - 6-year core grants in addition to 3-year standard grants
    Option 3 - 5-year rolling exploitation grants alongside standard grants (the current system).

26. A paper was then produced with further detail on these options, and this was circulated on 29th July 2010 to the Grants Panel Chairs for their input (see Annex 3) and then, following minor revisions, was posted on the STFC website for community consultation on 14th August 2010.

27. 85 individual and group responses were received from the community and these were discussed at the third and final Review Panel meeting on 8th September 2010.

Initial Panel Findings

Research concentration

28. There was already a high degree of concentration of STFC research funding as six universities accounted for nearly half of the current spend through the Grants Panels (Oxford, Cambridge, Manchester, Imperial, Liverpool and UCL).

Future funding flexibility and long-term support

29. It is important to establish a balance between providing future funding flexibility and providing long-term support where this is required. The proportion of grant spend that was already "committed" in future years via rolling grants would not necessarily be a particular problem in a stable or increasing funding environment, although it did reduce flexibility, but in the current financial climate it raised significant concerns regarding the loss of flexibility to respond to new opportunities and the ability to meet existing commitments.

30. On the other hand, the degree of ramping down now being applied by all Grants Panels in years 4 and 5 of rolling grants, had already severely curtailed the level of grant commitment beyond three years (see Annex 2), significantly reducing long-term support for core staff.

31. In Particle Physics Experiment Rolling Grants, the commitment in year 4 reduces to approximately 45% of the level in year 2. In Astronomy the commitment in year 4 reduces to around 60% of that in year 2 and in Nuclear Physics the commitment in year 4 reduces to approximately 78% of the level in year 2. This is a higher proportion than in Particle Physics because the Particle Physics Rolling Grants were issued after a new policy was introduced not to award indirect/estates costs in years 4 and 5.

32. In response to recent reductions in grant funding, all Grants Panels had given even closer scrutiny to the case for academic fEC in order to ensure that the level awarded was fully justified. If a further significant cut in grant funding were to be made, this could fall almost entirely on RA posts, thus endangering the future sustainability of the community. There was therefore an urgent need to look at other funding models that would provide the flexibility in lean times to retain key people and skills, while at the same time supporting the next generation of scientists.

33. Also in response to recent funding reductions, the funding set aside for standard grants rounds in Particle and Nuclear Physics had been severely reduced and there was concern in the community that this was stifling a route for researchers to obtain funding fairly quickly for new ideas as well as disadvantaging smaller groups. In Astronomy the balance between rolling grants and standard grants has not changed, however the funding available has been reduced proportionally, whilst ensuring that the standard of grants awarded in both schemes was the same.

34. The differentiation between standard and rolling grants had been eroded over recent years and was now more likely to be defined by the scale of award, e.g. in Astronomy, rolling grant proposals that secure fewer than 3 RAs were being issued as standard grants.

35. While there was some flexibility in moving staff from one project to another in Particle Physics, Nuclear Physics and Astronomy Rolling Grants, for example where projects had been delayed, the general view of the community was that this was limited, particularly in Particle Physics where some staff posts were "ring-fenced" to a particular project.

Standard grants

36. One option would be to move all grant funding to standard grants of maximum three years duration. This would remove long-term (more than three years) commitments and provide a simple, consistent funding model for all groups.

37. However, it would mean that support for key technical and engineering staff might be spread across a number of grants. Such a model would make it very difficult for any grants panel to get a view of the UK capability and future requirement for key skills in a particular field. The Particle Physics Grants Panel was currently able to do this by reviewing all the experimental rolling grants together. It would also curtail long-term support for these key staff.

38. Nevertheless, it is a model used widely across the councils and thought worth considering.

Platform/Core Grants

39. One way to provide longer-term support for key skills and to see the "big picture" in terms of national capability and future requirements, might be to separate off the long-term support of generic core effort from "project-specific" core effort. For example, the former Nuclear Physics Platform Grant in EPSRC did not fund project-specific support posts nor include support for RAs. In this model, when support was required for project exploitation, some resources could be used from the Platform Grant and additional effort requested via an exploitation grant.

40. The Nuclear Physics community had experience of Platform Grants within EPSRC, and while they had been reasonably successful in maintaining key skills, the method of implementation in EPSRC, where all the resources were routed through a single grant to one University, placed an administrative burden on the lead university due to the need to then transfer resources to the other partner universities. The Nuclear Physics Grant Panel view was that cross-institute Platform Grants could be made to work, but the administrative arrangements would have to be robust.

41. The EPSRC Platform Grants provided travel for academic staff. This might be an option for STFC to consider as it would be useful for academics who were not

likely to get an RA grant, for example, in Particle Physics Theory where there were currently 4.1 academics per RA post funded, or in Nuclear Physics, where such funding could enable researchers to travel to facilities to compete for beam time. Visitor grants could perhaps also be included in such an option. Providing travel funding in this way might also increase opportunities to leverage additional funding from other sources. In awarding such funding, there would have to be a linkage to STFC grant funding for the academic staff receiving support, otherwise the scheme would encroach upon quality related research funding.

42. It was very important that any such baseline support via a core grant should still be seen as competitive, and judged by peer review against scientific excellence in some way, otherwise certain groups would be seen as being privileged. It must also be possible for any such baseline support to be removed, or to grow, based on performance.

Construction Projects

43. The Panel noted that, in the Astronomy Programme and in particular the Space Science area, the staff involved in the construction of projects were building specialists who in many cases were not the same as those who exploit the facility/instrument, unlike in the Particle Physics and Nuclear Physics Programmes where it tended to be the same teams involved in both construction and exploitation.

44. There was concern in the Particle Physics and Nuclear Physics Grants Panels about the apparent disconnect between the Projects Peer Review Panel (PPRP) and Grants Panels in the review of projects and their exploitation. This was particularly noticed recently, when the review timings, prioritisation and funding uncertainties resulted in each Panel trying to "second guess" the recommendations of the other. There was also an issue of differing views between the PPRP and Grants Panels on the relative priorities of the projects in a particular field, although this should, in principle, be addressed via the Programmatic Review process.

45. The Panel agreed that consideration should be given to the possibility of reviewing and managing the funding of a whole project lifecycle (construction, maintenance and operations) outside of the Grants Panel mechanism, as some projects currently are in Astronomy, which would focus the Grants Panel solely on the review of exploitation grants. This would solve the problem of coordinating the peer review of project funding between the PPRP and Grants Panels.

46. The Panel agreed that any future funding scheme should have the flexibility to support some level of generic research and development until it became mature enough for funding through the Project Research and Development scheme.

International Comparison

47. Looking internationally, the STFC community was probably the only community world-wide that had only one major source of funding. There was nothing really comparable to rolling grants on offer elsewhere: in some countries, e.g. Germany,

there were funding schemes that provided up to five years support, but there was no expectation of follow-on funding.

48. The UK was also unique in having people in universities and STFC laboratories who could both build and exploit facilities. In France, the construction work was undertaken by staff on open-ended contracts available for work; in the US most of the construction expertise resided in the national laboratories and in Japan most of this work was put out to industry.

Other issues

49. The Panel noted the significant proportion of current spend on Investigator Directly Allocated funding (from 11% in Particle Physics Experiment and Nuclear Physics up to 33% in Particle Physics Theory Grants). This cost was closely scrutinised by the Grants Panels, but STFC was committed to funding this element as part of the Full Economic Costs (fEC) agreement. How the Universities used this income varied greatly.

50. Small scale travel grant schemes, like that operated in the Nuclear Physics Programme and Astronomy PATT, had considerable merit in providing funds for researchers who had gained, for example, beam or observing time on a facility, especially for younger researchers trying to establish themselves, or those without grant funding.

51. There was a variation in practice between the Grants Panels regarding visiting panels for rolling grants. In Particle Physics Experiment, visits were made to institutions and these were valued by the community as they gave visibility and transparency to the assessment process. This did obviously increase the cost of peer review, but the number of visits required was low and groups visited/size of proposal were generally large. In Astronomy there are only visits where deemed absolutely necessary (e.g. new groups), and costs were kept down by the Principal Investigators (PIs) and 2 Co-Investigators visiting the Panel at Swindon rather than vice-versa. The Nuclear Physics Grants Panel operated in the same way as the Astronomy Grant Panel. The Panel agreed that it was clear that one size did not fit all as far as Grants Panel visits were concerned and there was a case, for example, for visits to see labs, workshops, experiments etc. where this was deemed a necessary part of the peer review process. However some threshold and/or guidance for undertaking such visits would be useful when administration costs were under such pressure.

52. The Particle Physics Grants Panels wanted more formula-funding of non-Staff costs, but under fEC rules STFC was not allowed to apply strict formulae. However guideline amounts that could be tested under peer review were permissible and routinely used by Astronomy. The Panel thought that some information could be fed back on levels awarded in past rounds.

53. The Particle Physics Grants Panel also raised the issue of how the Particle Physics Department at STFC Rutherford Appleton Laboratory (RAL) should be funded in the future, given the apparent disparity in the costs to the grants line of funding 'academic' STFC staff versus university academics. The Review Panel agreed that this should be looked into, and such a review should be extended to include RAL

Space Science and Technology Department, Daresbury Laboratory and the UK Astronomy Technology Centre. However this was outside the scope of the current exploitation grant funding mechanism review.

54. The Grants Panels appeared to be unsure about funding studentships through research grants and in fact very few were funded in this way (although the numbers of applications were likewise low). Some firmer guidelines were needed for the Grants Panels.

55. There was a danger, when funding was tight, that public outreach activities could get squeezed out, and so it should be a requirement of any future funding mechanism that a certain level of funding could be awarded for such activities.

56. Comments were received from the Grants Panels about insufficient strategic guidance from STFC – "there has been no roadmap, or other written guidance." They also said that they often did not have a clear understanding of available funding in a grant round and that this made it much more difficult for the Panel to give particular attention to the ranking of proposals around the "cut-off" line.

57. Following the Panel's initial findings, three possible options for future funding mechanisms were developed:
    - Option 1 - 3-year standard grants
    - Option 2 - 6-year core grants in addition to 3-year standard grants
    - Option 3 - 5-year rolling exploitation grants alongside standard grants (the current system).

58. Further information on the options can be found in Annex 3.

Summary of Responses Received from the Community Consultation

59. Having identified a number of possible options for a future mechanism (see Annex 3), the Panel invited feedback from the community. There was a very good response to this consultation, with a total of 85 responses from individuals, groups and organisations. A wide range of views were expressed but there was some correlation between the size of the groups and their response in that large groups tended to prefer "rolling grant" type support and some small groups preferred standard 3-year grants.

60. However the overall clear message was that one size did not fit all in terms of grant funding mechanisms and that the quality of peer review should not be compromised, whatever funding mechanism was adopted, or savings in administration introduced.

Option 1 - 3-year standard grants

61. This option received the lowest level of support in the consultation although some respondents thought that this option would create a level playing field and open up funding opportunities for good smaller groups and for junior researchers to forge their own research careers. There was some comment that the current rolling grant/standard grant system created a two-tier community (with those having rolling grants being more favoured).

62. It was also noted that some variations of this option would also encourage and facilitate more inter-university collaboration, which was thought to be beneficial.

63. However, the majority of respondents, and nearly all of the experimental community, considered that this option, where groups would be funded for only 3 years at a time, was incompatible with undertaking long-term projects and was best suited to well defined and time limited research activities. The main disadvantages of this option were that it would hamper the ability of groups to recruit and retain top-class researchers, technicians and engineers in an international market and it would be perceived, by the community and others, as a reduced commitment to supporting long term programmes which would increase uncertainty within the universities and with our international collaborators. Even though current rolling grants are now very heavily tapered in years 4 and 5, a low level of funding in those years was valued for the reasons above. It was also noted that, with the severe tapers now in place, moving to 3-year grants would not provide STFC with that much additional financial flexibility.

64. Respondents also thought that this option would greatly increase the administrative overhead in STFC and the universities because of the expected increase in the volume of standard grant proposals submitted.

65. It was also pointed out that, unless the standard grants were issued well in advance of their start date there could be problems, in attracting top-class people

due to existing international agreements on the timing of advertising and filling of RA posts.

66. Only a very few respondents thought that the Project Research and Development (PRD) scheme should be incorporated into this option.

Option 2 - 6-year core grants in addition to 3-year standard grants

67. There was more support for this option than Option 1 because the community recognised that it would provide longer term funding for key core staff and would enable high-quality research groups, for example, to maintain involvement in international collaborations through periods when funding for standard grants was restricted.

68. Respondents thought that funding a large number of academic staff via this option would have an impact on the number of core grants that could be funded and on the funding available for standard grants and that this might result in smaller but just as high quality groups being squeezed out. There was also little support for funding a higher level of fEC to the PIs of core grants.

69. The community thought that it was important to ensure that core grants supported top priority STFC projects. Clear criteria for supporting such grants would also need to be developed. There was also concern that such grants could create inertia in the system if recipients of core funding were not subsequently successful in getting standard grants and STFC was then supporting a large number of staff not allocated to specific projects.

70. There was some comment on the definition of core posts. In the options paper they were defined as engineering, technical, IT and administrative support posts, but some respondents argued that core staff should also include career physicists.

71. This option was considered to be more suited to the needs of large experimental groups, but less so for exploitation and theory groups, where PDRA funding was more important.

72. As in Option 1, respondents thought that this option would also greatly increase the administrative overhead in STFC and the universities because of the expected increase in the volume of standard grant plus core grant proposals submitted.

Option 3 - 5-year rolling exploitation grants alongside standard grants (the current system)

73. There was significant support across the community, but particularly in the experimental community, for a continuation of stable, long-term support for research groups, currently supported through rolling grants, because of the typically long timescales in experimental projects, space missions and many instrument programmes. They offered flexibility in the use of resources, encouraged universities to support additional academic posts, allowed researchers to tackle long-term problems and enabled groups to leverage other resources from

the universities (e.g. laboratories etc.) and elsewhere. There was a general view that the current system had evolved to allow the support of maximum science from the available funding.

74. This option was considered to be the most administratively efficient, because it would not increase the number of proposals submitted. Further savings could also be made by encouraging smaller groups to consolidate with others and by streamlining the peer review process. Several people also suggested consolidating theory and experimental grants within departments, but with separate peer review, i.e. theory parts reviewed by theorists who would be part of a single (e.g. particle physics) Panel, as currently happens in astronomy.

75. In response to STFC's need to retain more financial flexibility, the particle physics community suggested that longer term grants of 3+1 years or 3+0.5 years might be a way forward especially if there could be more flexibility in the period over which the funding could be spent (to give more flexibility in the use of staff funding etc.).

76. The suggested threshold of 3 RAs for the award of a rolling grant was considered by many to be arbitrary and would unfairly penalise smaller groups and theorists. The view was that quality, rather than headcount, should be the criterion for funding.

Other Issues

77. There were very few other options offered by respondents, but there were suggestions that special calls could be issued for exploitation grants when new large projects came on line or that funding could be linked with time awarded on facilities. It was also suggested that restrictions could be imposed on "bidding-up", i.e. groups would only be allowed to ask for, say, one additional RA at each grant review because the time expended reviewing requests for multiple additional RAs was largely nugatory when funding was under such severe constraint. A couple of more radical solutions were suggested, such as dividing up available funding between active researchers based on Research Assessment Exercise-style performance metrics or giving exploitation funding to Higher Education Funding Councils etc to allocate.

78. There were many comments that the grant review process was too long and complex and that there was considerable scope for streamlining the process, without compromising the quality of peer review. Grants budgets are known to review panels at the start of the process whenever possible, however it was also requested that grants budgets should not be changed mid-review.

79. There was widespread concern regarding the operation of fEC, in particular the perception of driving down of the percentage of academic fEC funded through grants in order to protect the funding of post-doctoral positions and differences in practice between institutions regarding the return of fEC to departments.

Conclusions and Recommendations

80. The Panel concluded that different parts of the community had their respective preferences for standard or longer term (currently rolling) grants, despite the fact that there was in fact very little difference between them in practice, especially with the tapering currently being applied to rolling grants. So it was better to think of a future funding mechanism in terms of just one form of research grant for exploitation and theoretical research that had a degree of flexibility regarding the period of support for different elements. As a quid pro quo for this increased flexibility there could be administrative savings for both STFC and the HEIs by having a greater degree of consolidation in the grants awarded, thus reducing the number of proposals handled.

81. There was clearly a requirement for longer-term support of some core staff posts, but the exact definition of what was a "core staff post" varied between research communities, so this should be discussed and agreed between the grants panels and STFC. This discussion should also address the proportion of the grants budget that would be spent on longer-term core staff post funding in order to maintain a balanced programme (this was not expected to be a high percentage). The need for 6 years of core staff post funding was not strongly endorsed by the responses. Four years of core staff post support was felt to be an acceptable maximum duration.

82. The suggestion by the Particle Physics Experiment community that 3+1 year or 3+1/2 years grants might provide the further long-term support and flexibility was thought to be worth exploring and developing further

83. The community clearly thought that having only standard grants, or standard grants plus core grants, would not be administratively efficient for STFC or the universities due to the number of proposals that such schemes would generate. The Review Panel also noted that since starting its work, its terms of reference had changed from requiring any new mechanism to be administratively efficient to a requirement to actively reduce the administrative burden of STFC and the universities in the light of Government requirements to significantly constrain administration costs.

Consolidated Grants

84. Bearing in mind the above conclusions, **the Review Panel recommends that the existing standard and rolling grant mechanisms are replaced by a single consolidated grant scheme containing core and non-core staff post funding**. The features of such a scheme would be:

- Just one consolidated grant proposal per department (or equivalent academic sub-unit within the university) per subject area (Astronomy/Particle Physics/Nuclear Physics broken down in Particle Physics by Experiment/Theory) would be submitted every three years to STFC. This may include cross-department proposals.
- Astronomy would continue to review a third of its programme every year (if this proved necessary in terms of budget profiling and was administratively

efficient). Particle Physics and Nuclear Physics would keep their existing three-yearly review cycles.

- In institutions where there is both a department and another group, such as a research institute, in the same subject area, or where more than one department is involved in the same subject area, a single consolidated grant proposal would normally be expected. Agreement to submit separate consolidated grants would have to be sought from STFC by the relevant Head of Department and would not be automatic. An individual would however, only be supported on a maximum of one consolidated grant.
- The Grants Panels and STFC would define what comprises core staff post funding and the proportion of the grants budget to be allocated to core staff post funding for each community. This will be included in the guidelines to applicants.
- As at present, the Grants Panel could award consolidated grants without PDRA or other support positions. Any PI fEC awarded on such grants would, however, have to be subject to peer review.
- The consolidated grants would also incorporate funding for travel, visitors and access to telescope time removing the need for existing schemes for PATT, travel and visitor grants. This may result in a travel-only consolidated grant for some small groups.
- There would be no other research grant schemes for exploitation and theory other than the Astronomy and Space Science project grants that (for Space) include operations costs, but Grants Panels could agree to hold specific calls for proposals where, for example, a new large facility comes on line or a new research area opens up unexpectedly.
- Consolidated grants could include funding for project students and PIs of a consolidated grant could still be allowed to spend RA money on students if they felt this was appropriate e.g. if there was insufficient funds for a 2-year RA contract but enough to help fund a student.
- The Review Panel noted that there would be no advantage in adding student doctoral training grants into the consolidated scheme.
- There should be continued flexibility for staff to be moved between projects over the course of the grant. This would allow the redeployment of effort in case of unexpected changes to project timetables and would allow for new activities to be started in a small way before the next 3 year review. The need for annual grant rounds would be removed.

85. **The Review Panel recommends that encouragement should be given to groups from different institution's to apply for a consolidated grant in the same well defined research area (e.g. as a consortium).** This would give members of such consortia the opportunity to bid for shared resources that they might not be able to secure on their own, due to the size of their activity. Should groups apply in this way they would then be excluded from applying as part of their individual institutions application and would similarly be excluded from re-bidding in the same way as consolidated grants from individual departments. It was recognised that the details of this would need to be further developed.

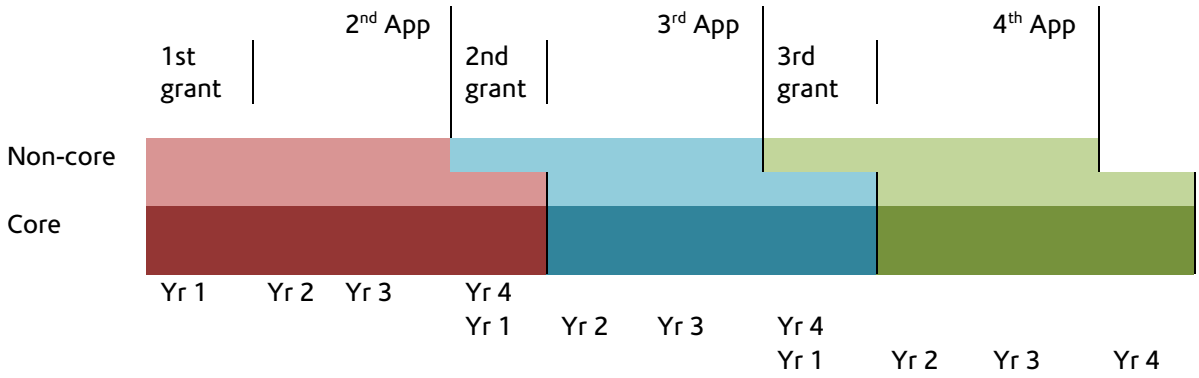
86. The expected impact of consolidated grants on the number of proposals submitted to STFC over a three year period is as follows.

Scheme	Number of current proposals received over a 3 year period	Number of consolidated proposals expected over a 3 year period
Particle Physics		
Rolling	**36**	**0**
Standard	**29**	**0**
Travel	**0**	**0**
Visitor	**1**	**0**
Consolidated Grants	**0**	**37**
TOTAL	**66**	**37**
Nuclear Physics		
Rolling	**9**	**0**
Standard	**40**	**0**
Travel	**50**	**0**
Visitor	**6**	**0**
Consolidated Grants	**0**	**10**
TOTAL	**105**	**10**
Astronomy		
Rolling	**48**	**0**
Standard	**300**	**0**
PATT	**75**	**0**
Other Travel	**Included in standard**	**0**
Visitor	**Included in standard**	**0**
Consolidated Grants	**0**	**66**
TOTAL	**423**	**66**
Grand Total	**594**	**113**

87. Based on the figures above, it is estimated that savings in administrative costs of 35% could be made on internal peer review processes and overall savings of 40% could be made on the total costs of internal and external peer review.

88. The plan for award and review points for consolidated grants will be as follows:
    - For grants without core staff post funding, grants will be awarded for up to three years, although with the flexibility to allow the funds to be spent over an additional year using the existing rules for applying for a grant extension.
    - For grants with core staff post funding, grants will be for up to four years with grants committed for non-core staff post funding for 3 years and core staff post funding for four years.

- A mechanism to transit to this scheme to provide planning certainty for groups is proposed;
- Using this sequence, STFC (apart from the first round of core funding) will only commit funds for three years, but the community will have the requested flexibility to spend these funds over four years.
- Second and consequent applications and their review will be undertaken early in Year 3 to allow funding decisions to be made sufficiently in advance of the next start date, especially to allow participation in international recruiting campaigns for RAs.



Making the peer-review process more efficient

89. The Review Panel strongly endorses the importance of excellent peer-review as one of the strengths of the current system, but believes that there are opportunities to improve the way in which it is delivered. **The Review Panel recommends that a working group be established to look into ways of making the peer-review system simpler and more administratively efficient whilst not compromising its rigour.** The group should include representatives from the Grants Panels and PIs. Possible areas to be investigated might include:

    - Awarding RA funding as unnamed FTE effort, at an average cost, justified by the approved programme and without restrictions on the start and end dates. This would give the recipients the opportunity to use the staff funding in a flexible manner and would streamline the amount of paperwork submitted by applicants;
    - Recasting the referee forms to eliminate repetitive questions and to produce more meaningful and useful assessments;
    - Reducing the length of the whole process, with an eye to the phasing of decisions, and ensuring that decision dates match recruitment cycles where relevant;
    - Providing some guidance/criteria for undertaking Grants Panel visits;
    - Providing guidance on funding levels of non-staff costs from previous rounds to manage expectations.

Project grants

90. The Review Panel recommend that project grants should remain as standard grants and departments can hold project grants in addition to a consolidated grant. The Review Panel agrees that construction projects require the proper investment appraisal that PPRP provides but **recommends that better linkages should be established between the PPRP and Grants Panels**, for example by synchronising the timing of consolidated grant and project reviews, by utilising cross membership and by direct communication between the respective Chairs. Similar linkages between the Grants Panels, STFC and the UK Space Agency, as agreed under the "dual-key" mechanism, would ensure the co-ordination of project and exploitation funding between STFC and the UK Space Agency

91. The Review Panel recommends that the PRD scheme should remain a separate scheme and not be incorporated into consolidated grants as such projects may require the funding of specific specialist expertise and components. Consolidated grant funding should be used, however, to support generic R&D.

fEC

92. The Review Panel notes the widespread concern in the community regarding the operation of fEC, and that the recent (Wakeham) review of its operation recommended some efficiency drivers, for example through reductions in indirect cost rates. However, **the Review Panel recommends that the Grants Panels strike an appropriate balance between the funding of academic fEC and postdoctoral positions**.

Balance of funding

93. The Review Panel did not address the issue of the balance of funding between exploitation and theory grants versus the construction of and access to facilities as this was outside its remit. However, given that this had a major impact on grants budgets and hence the balance between long-term commitment and flexibility, the Panel **recommends that Council, Science Board and PPAN urgently address this issue.**

Funding STFC staff

94. **The Review Panel recommends that the apparent disparity in the costs to the grant line of funding STFC 'academic' staff versus university academics should be reviewed,** and that such a review should include RAL Particle Physics Department and RAL Space, Daresbury Laboratory and the UK Astronomy Technology Centre.

Studentships on grants

95. The Review Panel notes that the Grants Panels appear to be unsure about the criteria for funding studentships through research grants and that in fact very few

were funded in this way. **The Review Panel recommends that Grants-funding studentships should remain an option and guidelines on the criteria for funding studentships should be produced for applicants and the Grants Panels.** As now, project studentships should be funded for a minimum of three years and a maximum of four

96. The Review Panel considered whether the existing STFC PhD studentship scheme could be incorporated into consolidated grants, but recognised the practical difficulties of having studentships awarded in different subject areas in different years and having studentships overlapping between different grant award periods.

Science in Society

97. **The Review Panel recommends that a certain level of public outreach activity should be specifically funded on consolidated grants, subject to a well justified case and provided such requests were peer reviewed.**

Annex 1 - Membership of the Review Panel

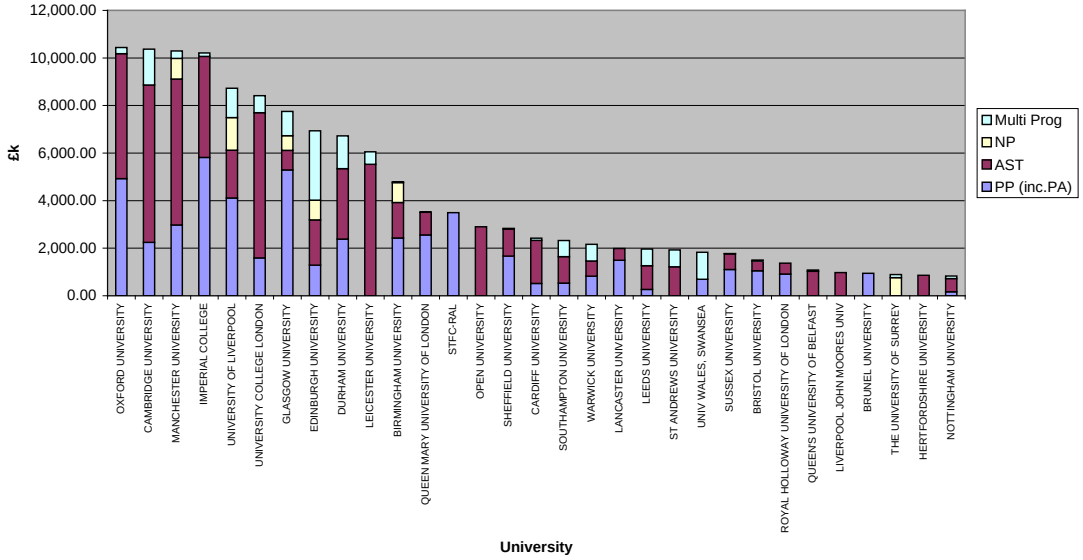
- Professor James Stirling FRS, University of Cambridge (Chair)
- Professor Mark Lancaster, University College London
- Professor Brian Fulton, University of York
- Professor Michael Bode, Liverpool John Moores University
- Professor Michael Merrifield, University of Nottingham
- Deborah Miller, STFC (Project Manager)

Ex-officio

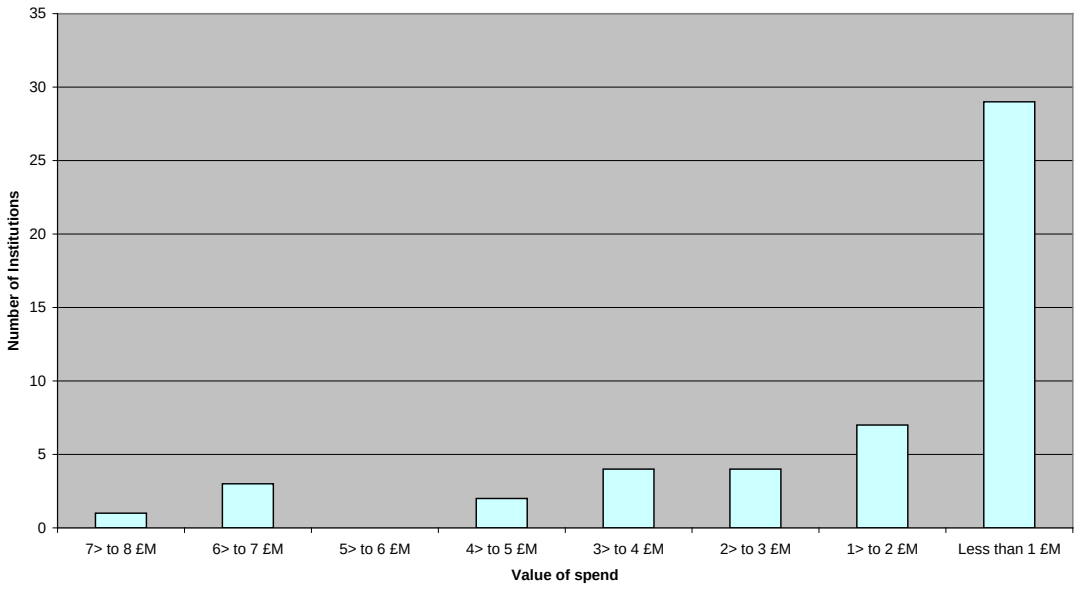
- Janet Seed, Associate Director, Science Programme Office, STFC
- Tony Medland, Head of Particle Physics & Nuclear Physics Division, STFC
- Colin Vincent, Head of Astronomy Division, STFC
- Rosemary Young, Programme Manager, UK Space Agency
- Andrew le Masurier, Head of Education, Training and Grants Policy, STFC

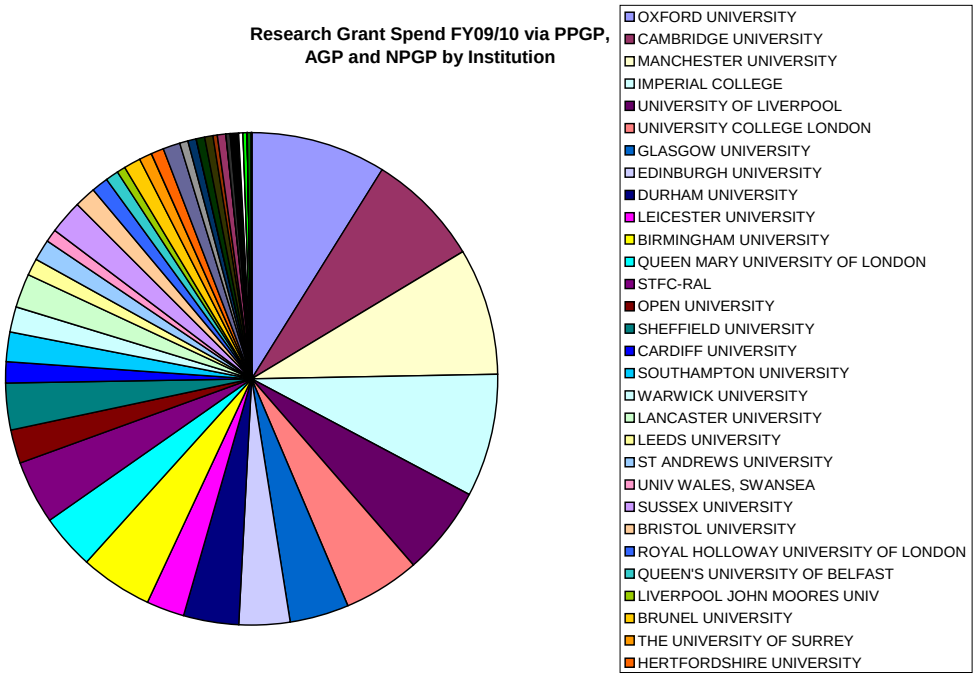
Annex 2 - Data on Current Research Grant Funding

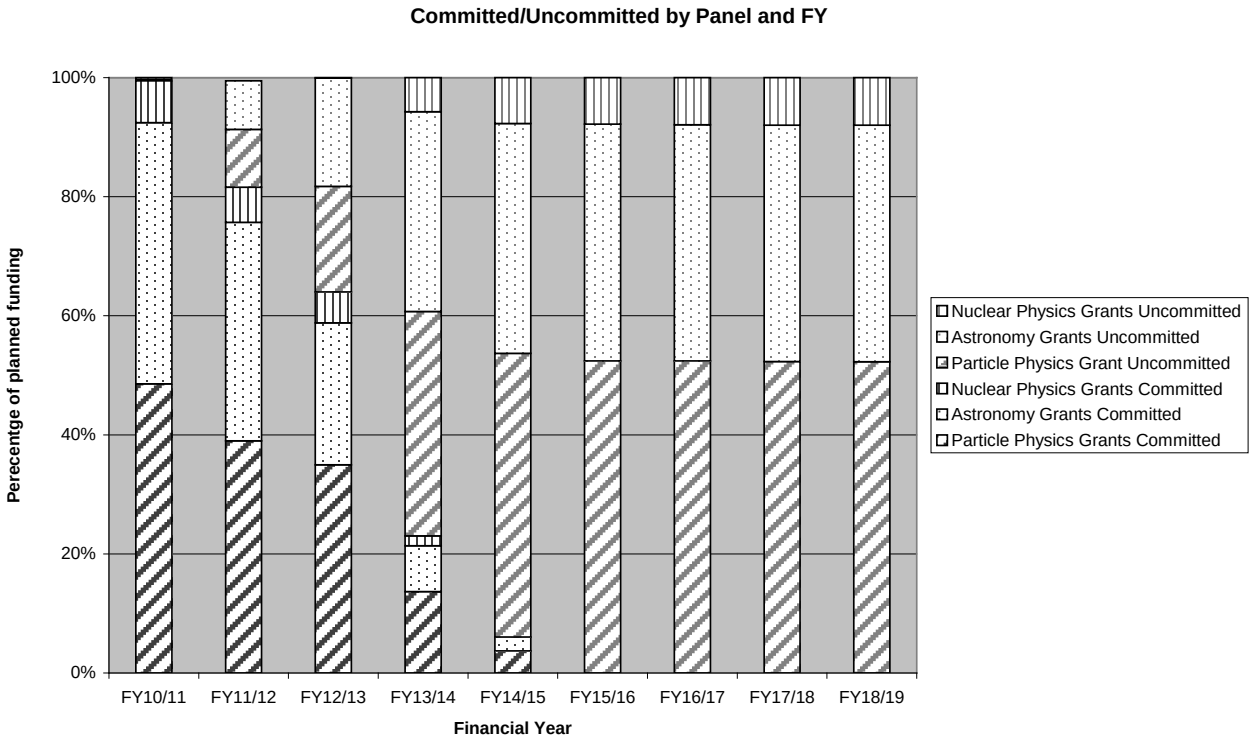
Research Grant Spend FY09/10 by Top 30 Institutions - all schemes/panels



Distribution of STFC Research Grant Spend for FY 2009/10- PPGP, AGP & NPGP




Research Grant Spend FY09/10 via PPGP, AGP and NPGP by Institution
OXFORD UNIVERSITY
CAMBRIDGE UNIVERSITY
MANCHESTER UNIVERSITY
IMPERIAL COLLEGE
UNIVERSITY OF LIVERPOOL
UNIVERSITY COLLEGE LONDON
GLASGOW UNIVERSITY
EDINBURGH UNIVERSITY
DURHAM UNIVERSITY
LEICESTER UNIVERSITY
BIRMINGHAM UNIVERSITY
QUEEN MARY UNIVERSITY OF LONDON
STFC-RAL
OPEN UNIVERSITY
SHEFFIELD UNIVERSITY
CARDIFF UNIVERSITY
SOUTHAMPTON UNIVERSITY
WARWICK UNIVERSITY
LANCASTER UNIVERSITY
LEEDS UNIVERSITY
ST ANDREWS UNIVERSITY
UNIV WALES, SWANSEA
SUSSEX UNIVERSITY
BRISTOL UNIVERSITY
ROYAL HOLLOWAY UNIVERSITY OF LONDON
QUEEN'S UNIVERSITY OF BELFAST
LIVERPOOL JOHN MOORES UNIV
BRUNEL UNIVERSITY
THE UNIVERSITY OF SURREY
HERTFORDSHIRE UNIVERSITY


Committed/Uncommitted by Panel and FY
Perecentge of planned funding
100%
80%
60%
40%
20%
0%
FY10/11
FY11/12
FY12/13
FY13/14
FY14/15
FY15/16
FY16/17
FY17/18
FY18/19
Financial Year
Nuclear Physics Grants Uncommitted
Astronomy Grants Uncommitted
Particle Physics Grant Uncommitted
Nuclear Physics Grants Committed
Astronomy Grants Committed
Particle Physics Grants Committed

Annex 3 - Description of Options Developed for Grants Panel/Community Consultation.

Option 1 - 3-year standard grants

1. In this model, all exploitation activity (including project maintenance and operations (M&O) for particle physics projects) would be funded via 3-year (maximum) standard grants. The detailed model would be open to variation for the different science communities, depending on the structure of their programme and projects, but the overall principle of 3 years support would be common across the STFC programme. The 3-year standard grants could be consolidated around a single project, e.g. ATLAS, where groups involved in that project could submit a series of linked grants (a single case for support and multiple JeS forms). Proposals could also be submitted by a single university for exploitation of a portfolio of smaller projects or for a single project. This would be the norm for theoretical work, although linked grants under a single theme, e.g. lattice QCD, would be possible. Funding for generic R&D would be included in these grants.

2. As a further variation on this option, support for project-specific R&D could also be funded via this route, thus negating the need for a separate PRD scheme.

3. The review of these proposals could either be undertaken in one exercise every three years (the current PP model) or in a phases over three years (the current Astronomy Grants Panel (AGP) model), but if the latter, as now, STFC would have to manage the available funding if the applications were not evenly spread over time.

4. In this model, a typical group, involved in say four projects, could have a portfolio of four individual grants each linked with other institutions with a variety of start dates. Alternatively, a group could have a 3 year grant supporting all their exploitation projects, with a greater degree of flexibility to move resources and staff between projects.

5. Another variation on this model might be for whole project lifecycles (construction, maintenance and operations) to be reviewed and managed outside of the grants panel mechanism, as some are currently in Astronomy, which would focus the proposed 3-yr standard grants (Option 1) solely on exploitation. Under this approach, construction project proposals would include an estimate of future operating costs (i.e. M&O, Post Launch Support), although award of post-construction phase operating costs would be considered by an appropriate review mechanism and awarded as separate grants.

Likely impact on number of proposals (cases for support, not JeS forms) received over a three-year period

	Number of RG and SG proposals received over last 3 years	Number of (multi-university, consolidated, single major project) proposals expected	Number of (single university-single project or multiple (smaller) project) proposals expected under option 1 -

	(expt. and theory)	under option 1 - over 3 years (all expt.)	over 3 years (expt. and theory)
PPGP	30 RG, 70 SG	6	102
NPGP	9 RG, 37 SG	Very few*	71
AGP	48 RG, 300 SG	Not relevant to Astronomy exploitation	450

*In NP it would make little difference to whether grants were consolidated around a single project or via multiple grants to individual universities. For exploitation work in NP, the community typically works either in small groupings (perhaps up to 3 institutions) or in single-institution mode.

Option 2 – 6-year Core Grants

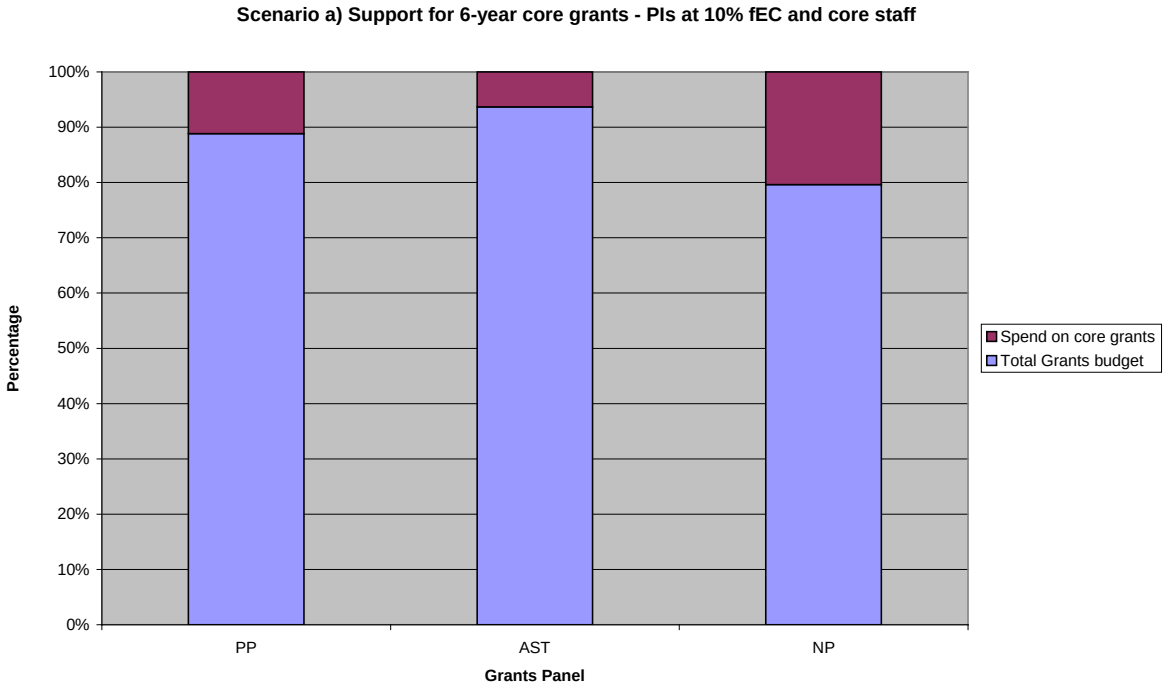
6. This option would provide, in addition to the 3-year standard grants outlined in Option 1, a degree of funding stability for key generic "core" staff (technical, engineers*, IT and administrative staff) and a low level of fEC for the PI managing the activity, through six-year grants. These grants would be reviewed at the beginning of the fifth year, when funding for the next six-year period would be considered.

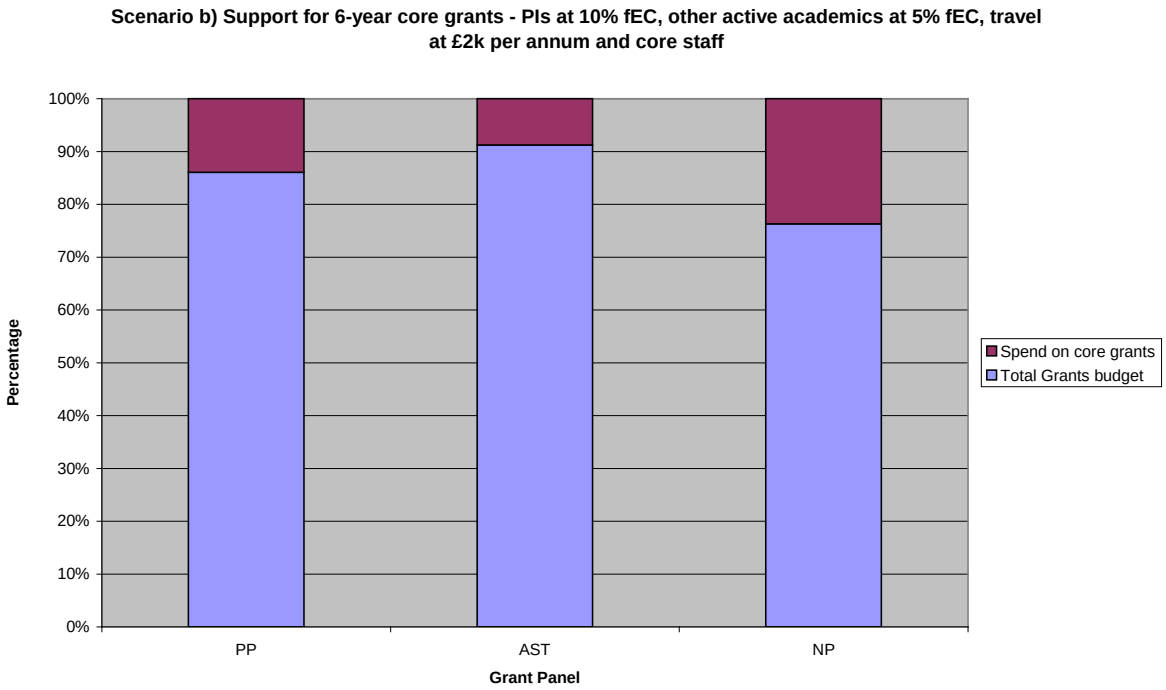
* A person with hardware (design, mechanical or electronic) expertise, rather than a career physicist.)

7. The level of funding provided by the core grant would depend on the number of groups receiving such support and the level of support provided (see examples below). This model is built on the premise that some low level of key "core" expertise and effort is required by the community, regardless of the projects they are involved in, to maintain generic capability. It is expected that project-specific core staff would be sought on the standard grants.

8. The Core Grant proposals would be peer reviewed all at the same time by the respective Grants Panels to allow them to assess the UK capability requirements as a whole. Core funding in the national laboratories would be folded into this process with PPGP reviewing RAL (PPD), AGP reviewing UK ATC and RAL (SSTD) and NPGP reviewing Daresbury Laboratory.

9. A variation of this scheme would be to fund, in addition, a low level of fEC and travel funds for research active academic staff above a quality threshold (in addition to the PI running the Core Grant), rather than all through the standard grants.





Option 3 - 5-year rolling exploitation grants alongside Standard Grants (the current system)

10. This option would retain 5-year grants with a three-year review point, but because of the reduced flexibility this would offer over the longer term, combined with recent and possible future funding cuts, the level of support/number of grants that could be funded would be at a significantly reduced level if the grants were not tapered in years 4 and 5 and a guarantee was given that that grants would not be cut

at the review point. Funding would also have to be set aside for standard grants. With this option, careful consideration would need to be given to the criteria for the award of (fewer, smaller) rolling grants, and also for the long-term future of those groups who do not receive them.

11. The number of rolling grants (exploitation/theory) expected to be supported in each area (PP, NP and Astronomy) in the future given current budgets. Astronomy figures assume the steady state after all groups have been through the 3-yearly review. All figures assume a lower threshold of at least three RAs for a group to receive a rolling grant (where grants fall below this threshold they are shown as converted to standard grants).

	Particle Physics		**Astronomy**		**Nuclear Physics**	
	Current	**Future**	**Current**	**Future**	**Current**	**Future**
Rolling Grants	**30**	**15**	**48**	**36**	**9**	**0-4**
Converted to Standard Grants		**17-22**		**25**		**20-30**