

ASTRONOMY FORUM: NOTES FROM FEBRUARY 2015

This meeting of the [Astronomy Forum](#) was held on Tuesday 3 February 2015 in the lecture theatre of the Royal Astronomical Society (RAS) at Burlington House, London.

In attendance:

Robert Massey (RAS, acting Chair for item 1, hereafter 'RM'), Martin Barstow (RAS & Leicester, Chair for item 2 onwards, 'MB'), Keith Smith (RAS, minutes), John Womersley (STFC, 'JW'), Julia Maddock (STFC), Natalie Bealing (STFC), Colin Vincent (STFC, 'CV'), Sharon Bonfield (STFC), Steven Hill (HEFCE, item 3 only, 'SH'),

and the following Astronomy Forum members:

Alan Fitzsimmons (Belfast), Alberto Vecchio (Birmingham), Mark Birkinshaw (Bristol), Andy Fabian (Cambridge), Ian Smail (Durham, 'IS'), John Peacock (Edinburgh), Janet Drew (Hertfordshire), Stephen Warren (Imperial), Coel Hellier (Keele), Michael Smith (Kent), Farideh Honary (Lancaster), Tom Hartquist (Leeds), Nial Tanvir (Leicester), Albert Zijlstra (Manchester), Mark Cropper (MSSL/UCL), Frazer Pearce (Nottingham), Stephen Serjeant (Open), Glenn White (RAL Space & Open), David Wands (Portsmouth), Richard Nelson (QMUL), Paul Crowther (Sheffield), Keith Horne (St Andrews), Peter Thomas (Sussex), Jonathan Rawlings (UCL), Tim Cawthorne (UCLan), Andrew Levan (Warwick).

Apologies for absence (no substitute available):

Ian Crawford (Birkbeck), Graham Woan (Glasgow), Chris Collins (Liverpool John Moores)

1. Welcome, introductions and election of Chair

Robert Massey (RAS) welcomed the participants and brought the meeting to order at 12:05. As Prof. David Southwood had resigned as Chair of the Astronomy Forum at the previous meeting, the first business was to elect a new Chair.

RM reminded participants that the Forum is independent of the RAS, who arrange and host the meetings, and may elect anyone it wishes as Chair. However, it has a history of appointing the current President of the RAS to the post, so RM proposed Prof. Martin Barstow. A vote was held and Prof Barstow was unanimously approved, so took the chair of the meeting.

2. Science and Technology Facilities Council update

Prof. John Womersley (Science and Technology Facilities Council, STFC) presented an update on STFC's activities since the last meeting of the Forum. The talk is [available on the RAS website](#).

The presentation included:

- Investment in new and withdrawal from older facilities.
- Minor revisions to the grants scheme (covered in more detail in item 4 below).
- STFC support for Green Open Access via the arXiv preprint server.

- Prospects for upcoming Comprehensive Spending Review and how STFC is making the case for investment.
- Community input into review of Research Councils would be welcome.

Discussion:

Most questions are deliberately not attributed, to encourage a frank exchange of views

- RM: The recent Science and Innovation Strategy (SIS) acknowledged that the UK spends less on research as a percentage of GDP than other developed nations and indicated this would be reviewed in the summer of this year. How do you react to that – is this an opportunity?
 - JW: SIS was a Treasury review, focussed on science as a strategy for economic growth. However they require evidence – if more money was spent on science, how do we demonstrate that this is better for the economy than spending in other areas? One area where an increase in funding would quickly feed through to the economy is STEM skills.
- All the major parties have pledged to deal with the budget deficit. However they each promise to protect budgets in certain areas e.g. health or overseas aid, which means non-protected areas – including science – get squeezed more. Is there not a danger of asking for too much and being laughed out?
 - JW: We've been talking to the Department for Business Innovation & Skills (BIS) about this. We need to convince the civil servants that increased funding is a good thing, as ministers are generally on side already. Ministers can tell a good story to voters, but we still need to be able to demonstrate why it's worth more than money invested elsewhere.
 - MB: The political climate now is different to that in 2010. The scepticism of ministers on science funding has now been overturned. There has been an ongoing campaign to demonstrate that there is real benefit in science funding, which now has lots of evidence. However the battle is not over, especially if there's a new chancellor after the election.
- Why use 2010 as the baseline level you want to get back to? The few years before 2010 were when the major problems occurred, especially for our science. Our goal should be better than that. Couldn't we argue about the bad policies that pre-date 2010?
 - JW: We must compare with the previous CSR, which means 2010. Getting back to 2010 levels will require a 25% increase over four years, which is already ambitious. The number of postdoc positions is down, and we will say that, but asking to go back further is not practical.
- The number of permanent astronomers in the UK has actually gone up since 2008. Is this sustainable?
 - JW: Flat funding has meant that the UK has slipped down from first to third in the rankings of citation weighted quality in astronomy research. Pointing out an increase in permanent astronomers is not a convenient narrative for us to make, and relates to university support. I certainly won't tell universities to stop hiring astronomers, but if we cannot expand research council funding accordingly there won't be enough grants, postdocs and students for them to do research. We should though stress that the overwhelming majority of doctoral students have never found permanent jobs in academia, but over 90% of doctoral graduates in industry say they would still have taken PhDs even if they had known they wouldn't get a job in research.

- There is a rumour that training grants are going to shrink i.e. the number of PhD studentships awarded to universities this summer will go down.
 - JW: There will be the same number of studentships awarded this year as last.

3. Astronomy Grants Panel update

Ian Smail (Chair of the STFC Astronomy Grants Panel. AGP) presented an update of the panel's activities. The talk is [available on the RAS website](#).

- The recent review resulted in only minor changes for astronomy, primarily splitting grants between two panels covering a) astronomy observation & theory, and b) planetary and solar science.
- AGP is now awarding small levels of Full Economic Cost (FEC) to investigators who fell just short of the cut-off for postdoctoral research assistant (PDRA) awards. This was an issue raised at the [previous Astronomy Forum](#).
- Naming investigators on grant award letter without attached funding is against the current rules, and changing this was turned down by STFC Science Board.
- There is no evidence for gender bias in success rates.
- There were a significant number of new interdisciplinary applicants.
- Funding levels are low e.g. on average UK researchers receive funding for 6hr/week on research, and postdoc support for one year in three.

Discussion:

- JW: Are there any groups which received no funding at all?
 - IS: There are large numbers of entire groups who got nothing.
 - JW: Over all STFC subjects?
 - IS: Yes, although less than just for astronomy. There were some universities where there was no support at all in astronomy, nuclear and particle physics.
- JW: Your discussion of new applicants demonstrates that astronomy is interdisciplinary. Researchers in other fields are bidding to expand their activities into astronomy research.
 - IS: That's great, and we welcome interdisciplinary research. However it needs to go both ways: are astronomers also bidding for funding from other fields? I don't know, but suspect that some of the movement towards astronomy is due to even bigger funding squeezes in other fields.
 - JW: There is a useful message here about the wide appeal of astronomy.
- IS: AGP feel that they need 20% more funding to provide a reasonable level of support. The balance between facilities and exploitation has gone too far.
 - JW: We came to a similar number ourselves and hope to support that.
- MB: Investigators should be named on grants even if they get 0% FEC funding. This costs nothing, but benefits the researcher. I am STFC Council member, but don't understand why the Science Board didn't support this.
 - IS: There is already a class of people (Fellows) who are named on grants but get no FEC. We were merely proposing to expand that to investigators, to avoid problems we all know well. Maybe we didn't sell it strongly enough.
 - MB: Perhaps in other fields grants are seen as being individual achievements, whereas in astronomy we regard them as awards to a whole group.

- Other research councils see the award letter as a contract between the university and the research council. If investigators are named on the ‘contract’ despite getting no funding, this could be seen as problematic by some.
- *Multiple participants expressed support for AGP’s proposal.*
- JW: STFC communities have different ideas of how FEC should work. Astronomers treat it as an adjustable parameter, whilst other communities award a fixed fraction. There are clear differences between the ways the communities operate. Astronomy tries to spread funding around, in an effort to support the health of their whole discipline. Grant panels in other fields see themselves as approving or disapproving individual requests – supporting successful ones strongly and unsuccessful ones not at all.
- Grant assessments have been split between astronomy and planetary/solar panels, but a department’s submissions to both panels must be made in the same year. Why?
 - IS: a) This is the natural point for new bids to be submitted, when the previous grant is ending. Both strands should be in the same 3-year cycle by default. b) It allows AGP to see if investigators are moving across panels, or are named on both grants (to prevent double dipping). I can see that this imposition might be problematic if a new activity starts at an institution. In that case AGP will consider requests for bridging funding to get both strands onto the same cycle.
 - It would be less work and stress if they were in different years.
 - IS: The expectation is that the two strands will mostly be prepared by different people, so it shouldn’t make much difference.
- Further clarity is required on which subjects go to which panel. In particular I am unsure whether exoplanet research should go to the astronomy or planetary panel.
 - IS: Exoplanets are part of the astronomy panel remit. Our advice is to raise any queries with the grants office as soon as possible. If projects are submitted to the wrong panel they will not receive funding. If you are in any doubt, contact [Kim Burchell](#) at STFC.
- I am still concerned about the distribution of groups between the three cycles. The oversubscription factor changes from year to year, which is unfair on groups which have to bid in the tougher years.
 - IS: Bridging requests need to be taken into account for the 2011-2013 rounds, while we were still implementing the consolidated grants scheme. However, even when you do this I agree the requests don’t fully even out. AGP can deal with this by either moving funding or volume between the cycles. We find it easier to move money. However I don't think it works as well as it should.
 - Our department thought about moving to a different (less-oversubscribed) cycle, but it turned out to be impossible due to the consolidated grants rules.
 - IS: Lots of people who were previously on the ‘standard grants’ scheme submitted bids in the first (2011) round, when they didn't have to. That skews things.
 - We were encouraged to do so.
 - IS: In the steady state this will work out, because the funding in each cycle will be proportionate to the volume of applicants in it. However, there are always new groups formed, new applicants in existing groups, or changes to the overall funding level (e.g. a CSR), so unfortunately we won't ever reach the steady state.
 - Those events should be distributed randomly between the cycles.

- *Several participants argued that those events are not uniformly distributed, and that it would be unfair to force new groups to wait until the next undersubscribed round.*
- CV: STFC can work to normalise things as much as possible, but there are always external events to upset this. At present the year-to-year movement of funding is in the region of £5m.
- Anyone who has been awarded a new PDRA in November will know how tough it can be to recruit someone before April e.g. due to notice periods. It's almost impossible unless the department already has someone in post, who simply transfers to the new grant.
- IS: If there are justified reasons then extensions can be granted. I agree this can be difficult.
- JW: STFC has occasionally been approached with requests for bridging funding in this situation. We do not have funding for this, which is a side effect of the fact that there is no spare money in the system. New groups need to be aware of this.
- IS: Responsibility for supporting new groups should fall upon the institution that set up the group, at least for the first few years until the relevant grants cycle.
- Our department hired two new staff, of which one was allowed to apply for bridging funding and one was not, due to their previous funding arrangements. We felt this illustrated an inconsistency in the rules.
- IS: We deliberately decided to exclude investigators who were Fellows supported by the previous grants round. This stops universities gaming the system e.g. by timing job offers based on the grant deadline. Once personnel start their teaching position then they become eligible to apply for grant funding.
- Must applicants be teachers?
- IS: No, but they cannot be receiving existing support i.e. double dipping.
- This approach means we won't be supporting the best people coming through the system.
- IS: The system is imperfect, and not the one I would have designed, but we have to work within it. The idea is to direct support to where it is most needed.
- Sure, but does this grow the community most effectively?
- IS: The same situation arises with those funded by European Research Council (ERC) grants. We cannot provide special treatment for everyone. The new staff member only has to wait one or two years until the next cycle.
- CV: There is no extra money for these cases. It would have to come from the AGP budget, eating into the main grants programme.
- I am not convinced that this is best for the research excellence of the community.
- IS: We need to strike a balance between supporting breadth or depth. The AGP does not want to decide strategy, so follows the guidance we get.
- About a third of UK postdocs are now ERC funded, more than STFC. Do you consider that when arranging how grants are issued? ERC grants come with no overheads or FECs. Departments who receive them get postdocs, but no support funding. Similarly for studentships. Shouldn't this be part of a national consideration? The ERC is the only reason astronomy in the UK hasn't collapsed more than it did.
 - IS: ERC grant holders have a hard time justifying further PDRAs. The STFC scheme is assessed on the quality of the proposed project. If there is no case for a PDRA – because they already have one funded by ERC working on the project – then there is no case for investigator FECs. ERC grants also require investigators to spend >50%

of their time working on the project, so little could be requested from STFC to avoid double dipping.

- You are not supporting the best people in the country. Those who have ERC grants don't get fully supported.
- IS: That is up to ERC. As for students, I have argued against allocating students based on AGP outcomes. The Education, Training and Careers Committee (ETCC) should not do this.
- ETCC is now asking about other sources of funding.
- JW: We are not in the situation where ERC grant holders are ubiquitous, but nor are they so rare that we don't have to think about it. We haven't quite worked out how to handle this situation yet, but I agree that the issue cannot be ignored.
- What was the largest increase in the number of PDRAs awarded to a single group?
 - IS: Three, to a group which received zero in the previous round.
 - Why not set a maximum bid, say of the current number plus four?
 - IS: I would prefer a multiplicative factor. AGP haven't been keen on a cap, in the hope that the size of bids would sort itself out. However, the results show that over-bidding is *not* bad for outcomes. We cannot sensibly triage bids before the full assessment.
 - You could push that task onto the departments; get them to do the triage.
 - IS: That would not work. Departments are not good at self-selecting the world-leading research. Nevertheless, the workload on the AGP was too high. Either we need to reduce applications or increase the size of the committee.

4. Research Excellence Framework outcomes

Steven Hill (Higher Education Funding Council for England, HEFCE) presented a discussion of the recent Research Excellence Framework (REF) results. The talk is [available on the RAS website](#).

- HEFCE has checked for unjustified grade inflation, biases against early career scientists, those with career breaks, interdisciplinary fields etc. and found no evidence that they exist.
- There is however a clear difference between subject areas.
- This is the first time that 'impact' has been included in the rankings. Impact scores generally have a broader distribution than traditional 'outputs'.
- The formula for how rankings translate to funding is still under development, although both 3* and 4* ratings will receive some level of funding.
- An evaluation report of the whole REF is currently in process.

Discussion:

- The grade point average (GPA) for the best institutions in physics is definitely lower than the GPA awarded in other sciences and engineering. This is problematic when departments are compared within universities – physics looks bad.
 - SH: A lot of effort went into calibrating between the subpanels operating within main panel areas. Main panel chairs have absolute confidence that there is good calibration within the broad fields covered by each main panel. In general there was less cross-calibration between sub-panels in different main panels, so the comparison between diverse sub-panels is less robust.

- I find that hard to believe, as physics clearly did worse even within the physical sciences panel.
- SH: That was the conclusion of the panel. If you think that this was imperfect then that is an issue for the panel.
- MB: That is not the message we on the panel received.
- Occasionally physics was under rated, however the gap is much smaller than it was in 2008. Calibration has not been done well in the past – can we really believe it was perfect this time?
- MB: Rankings based on bibliometrics (e.g. citation data) do not always agree with the REF rankings.
- SH: Peer review and bibliometrics are never perfectly correlated. It's not obvious which of those two methods is better; certainly neither is perfect.
- The Institute of Physics recently held a panel discussion on the REF. They reported higher numbers of 4* ratings in impact than output in physics – but also that the panel members were unclear on boundaries between ratings for the impact score.
 - SH: That is something we have been hearing. It is perhaps not surprising because impact rating is something new, whereas output rating is something scientists do implicitly all the time in their professional lives.
 - What is the plan for future assessment exercises? To increase impact to 25%?
 - SH: We don't have a plan. The evaluation is currently ongoing, and the weightings will be assessed in the future.
 - JW: There is a fundamental difficulty in scientists judging impact, because impact by definition is on people outside the field.
 - SH: Absolutely. We included 'research users' on the panels for impact evaluation. It is also worth remembering that almost all outputs had already been reviewed once e.g. as part of journal peer review, whilst impact case studies had not been.
- The 'research environment' scores had a very high dispersion. Apparently some universities brought in external consultants to help prepare their environment submissions.
 - SH: We are aware of this and need to look at it. It is somewhat problematic. We need to think carefully about this for the funding equation.
- The environment scores in physics strongly correlate with the department size. Is that also true in other disciplines?
 - SH: I don't know about department size, but the distribution against institution size looks OK. Smaller institutions have a higher dispersion.
 - It's not just that: there are small departments with high output or impact scores, but none with high environment scores.
 - SH: This is worth us investigating further.
 - Is it deliberate?
 - SH: That's up to the panel members.
 - MB: The panels were given numeric data (per FTE) on each department and the mean for the sector. These are crude measures but were normalised per FTE.
 - It is easier to put together a coherent submission for big departments.
 - MB: In small departments individual achievements suffer from small number statistics. Some departments are very good at e.g. nominating people for prizes, others are not. There are clearly issues that work against small departments.
 - The 'sector' just means physics, so how do panel members know their rankings were OK compared to other fields?

- MB: Panel members didn't get data beyond physics.
- SH: It would be useful for panel members to know not just the average, but also the variance across the field. This can be very different between fields e.g. in music there are lots of departments with 10 people, whereas physics has a small number of departments with large numbers of people in them. That data might be helpful to panel members
- MB: Environment is the most difficult area to score objectively.
- SH: We've noticed that.
- When will the next REF be held?
 - SH: We're still finishing off this one. The review will probably have consultation in autumn 2015, maybe spring 2016 to finalise recommendations. That says nothing about when the next round is, but if people know what the process will be then that would help them prepare. 2021-22 is realistic.

5. Overall funding levels for university departments

Martin Barstow (RAS) led a discussion of the overall funding levels of departments in higher education institutions.

- MB: We've spoken a lot about the details of grants and research funding. There's also money that comes in for teaching students from HEFCE and student fees. Are all departments feeling under similar pressures? Physics students cost more to teach than arts and humanities students. The income per undergraduate is about £8k/yr for all subjects, but physics costs about £12k/yr to teach, while arts subjects are more like £5k/yr. The 'STEM uplift' was cut last year and even before that it didn't make up the full difference.
 - RM: The funding mechanisms are different in Scotland. It would be interesting to hear whether groups there are experiencing the same issues.
- MB: Are universities putting pressure on redistributing funds internally?
 - Yes, we are currently being told off by our university for running an expensive subject i.e. a deficit.
 - Our department has been relatively lucky.
- MB: Do any of you feel threatened? Are departments vulnerable and might have to close?
 - *No responses.*
- MB: I realise that this may be difficult to state publicly, so if you do have concerns please contact me in private. We have stable research funding through the flat cash settlement but that's only part of the funding picture.
 - We're running a deficit. The university told us to make it up with overseas students, which is what our engineering department had done.
 - MB: There are only a very small number of overseas students that can be attracted, and they cannot possibly make up the difference.
 - On the contrary, my department doesn't have enough space for all our overseas students. We find it very easy to recruit them. Perhaps that's because we're in London. We would take even more if we had sufficient space.
- JW: Some Vice Chancellors have told me that astronomy groups may get grant funding, but they receive little in the way of FEC. This seems to differ a lot between universities, which have different strategies. STFC has to operate a single system.

- You can get a different answer from the department to the one from the university, depending on how the money is moved around.
- JW: There is a tension between what's best for the research community – more postdocs – and what university administrators want – overheads and FEC. The research council has a mandate to support research, not support universities.
- MB: Universities try to maximise their income, not their research output.
- FECs are not worthless – investigators do research as well as postdocs.
- JW: We all know that we cannot afford to support FEC properly, and that overheads and FEC do not fully cover the true cost of the departments. We are reliant on there being some cross subsidy.
- If this support gets cut any further then departments will be forced to close.
- Our university has staffing levels that assume some level of income from grants. If for some reason they don't get any grants they won't be able to pay the salaries. This is risky.
- MB: The RAS has been sufficiently concerned about the European funding system that we are banding together with other European national societies to fund a representative in Brussels for lobbying purposes. For example, the new head of the European Commission has abolished the post of Chief Scientific Advisor, which we feel is a backwards step.
- STFC used to run a senior fellowship scheme, which some other bodies still do (e.g. the Royal Society). If someone gets an ERC research grant then they don't teach, which leaves the burden to fall on other staff members.

6. Any other business

MB encouraged delegates to visit [Light Works](#), an exhibition supported by the RAS and Royal Photographic Society and funded by STFC, which was then on display in the courtyard at Burlington House as part of the International Year of Light. It will also be exhibited in Belfast and Edinburgh.

The meeting closed at 14:55.