

Report on Particle Physics Theory Consolidated Grants Review 2019

Nick Evans (PPGP(T) Chair)

**STFC Town Meeting
18th December 2019**

Flat Cash Funding Environment

STFC PPGP(T) funding has been flat at £6.5M per year for 10 years...

Consolidated Grants 2019

18 proposals from 24 institutions + IPPP (5 from consortia) supporting 223 academics in 52 scientific areas (51 areas in CG11, 48 in CG13, 43 in CG16)

Trend data on size of community and award

University groups	2005	2008	2011 ¹	2013	2016	2019
Budget	-	£16.9M	£14.6M	£15.2M	£15M	
Number of academics bidding for non-zero academic time	122	155	163	176	186	223
Number of academics funded	-	-	146	161	134	
Maximum academic time awarded	-	28.50%	20%	20%	20%	
Average academic time award (among non-zero awards)	-	20%	14%	16%	13%	
Number of PDRAs per year (FTE)	34 (+7 SPG)	34.3 (+1 SPG)	29.3	28	32	
Ratio of PDRAs per bidding academic	-	0.23	0.18	0.16	0.17	
Ratio of PDRAs per funded academic	-	-	-	0.17	0.23	
Number of bidding academics per RA	3.6	4.6	5.6	6.3	5.8	

Growing fast +9%
(IPPP below!)

Lowest ratios in STFC

IPPP	2008-2018	2018-20
Budget	£15.9M	
Number of academics supported ²	16	
Maximum academic time awarded	44% ³	
Academic average academic awarded	40%	
Number of PDRAs per year (FTE)	8.2	
Ratio of PDRAs per academic	0.52	

The PPGP(T) Panel

Nick Evans, Southampton (Chair)	(QFT)
Richard Ball - Edinburgh	(phenomenology)
Frank Krauss - Durham	(phenomenology)
Christoph Englert – Glasgow	(phenomenology – collider expertise)
Antonio Rago - Plymouth	(lattice)
Matthew Wingate - Cambridge	(lattice)
Claudia de Rham – Imperial	(astroparticle - formal)
Malcolm Fairbairn – KCL	(astroparticle - pheno)
Gabriele Travaglini - Queen Mary	(QFT)
Carlos Nunez – Swansea	(Strings)
+ 2 from experimental panel	
Ryan Nichol – UCL	(experimental)
Helen O’Keeffe – Lancaster	(experimental)
Sarah Verth – STFC Programme Manager	
Jane Long – STFC Grants Manager	

2018 Particle Theory Review

- The importance of [maintaining the breadth of the programme](#)
- STFC should continue to support a small amount of high risk, high reward research
- [Additional funding for PPT should be found to support additional PDRA posts](#). The low level of PDRA support was considered to be an [active threat](#) to the programme
- In a flat cash programme the panel [reluctantly](#) recommended if needed [decreasing the average level of academic time](#).
- The importance of [maintaining support for travel](#) and visitor funds on consolidated grants especially where there are low PDRA numbers.
- The establishment of [Virtual Centres](#) in Cosmology and Strings/QFT [to support community and encourage cohesion](#).

Panel's Starting Plan

The panel proposed to fund only the same number of FTE as in 2016 (134+16)

For the first time the panel agreed to actively highlight weaker academics within stronger funded science areas and remove them from the grant

The panel proposed to fund slightly more RAs 40.2 -> 43 (+7%) 3 year at expense of fEC level...

We are now routinely making this 64.5 2 year posts...

+ seed fund Virtual centres.

BUT

Request for overheads by Universities went up by 47%.. So we have reduced fEC to 8% as other STFC boards have...

The panel, with regret, chose to leave all of these unchanged:

- Travel: £1500 pa per active researcher
- Consumables/computers: £600 pa par

- New Applicants: £10k pa
- Conferences: £15k pa

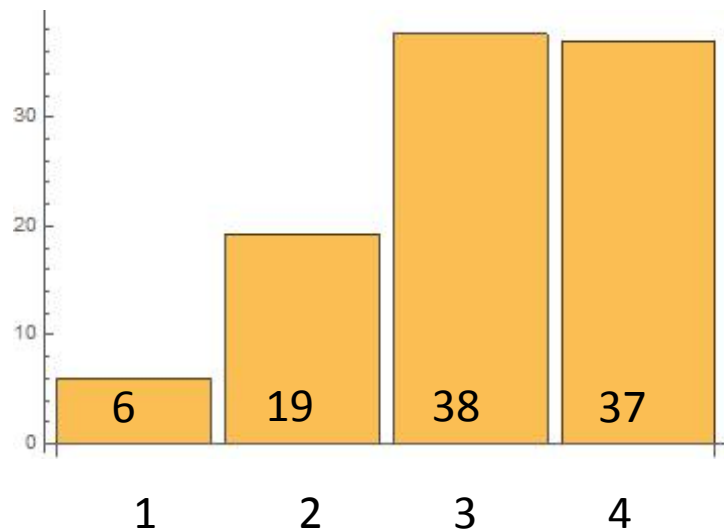
All amounts unchanged from CGI3

Panel does *not* recommend funding:

- contribution to operating costs of experiments

Bristingham – Holography For Perturbative Theories

Total 8/6 FTE academic requested



Score: 306

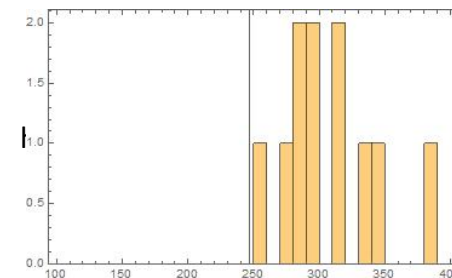
Rank: 7

Score x FTE: 1,834

Rank: 9

Algorithmic Postdocs: 2+1 years

Requested: 2 RA



Commentary From Introducers:

Scientific Excellence:

International Competitiveness:

Strategic Value:

Productivity of the Investigators:

Quality of Leadership:

Suitability of the Institution:

**This is how we
displayed our scoring
at the June meeting....**

Panel Discussions Then Lead to Divergence from the Algorithms

This is hard to summarize because it is a collective process.... Although we tried to collect feedback for groups (each group had a panel member concentrating on it)...

Had we followed the 2016 process 19 of the 52 science areas would have been unfunded including entire large University Groups.

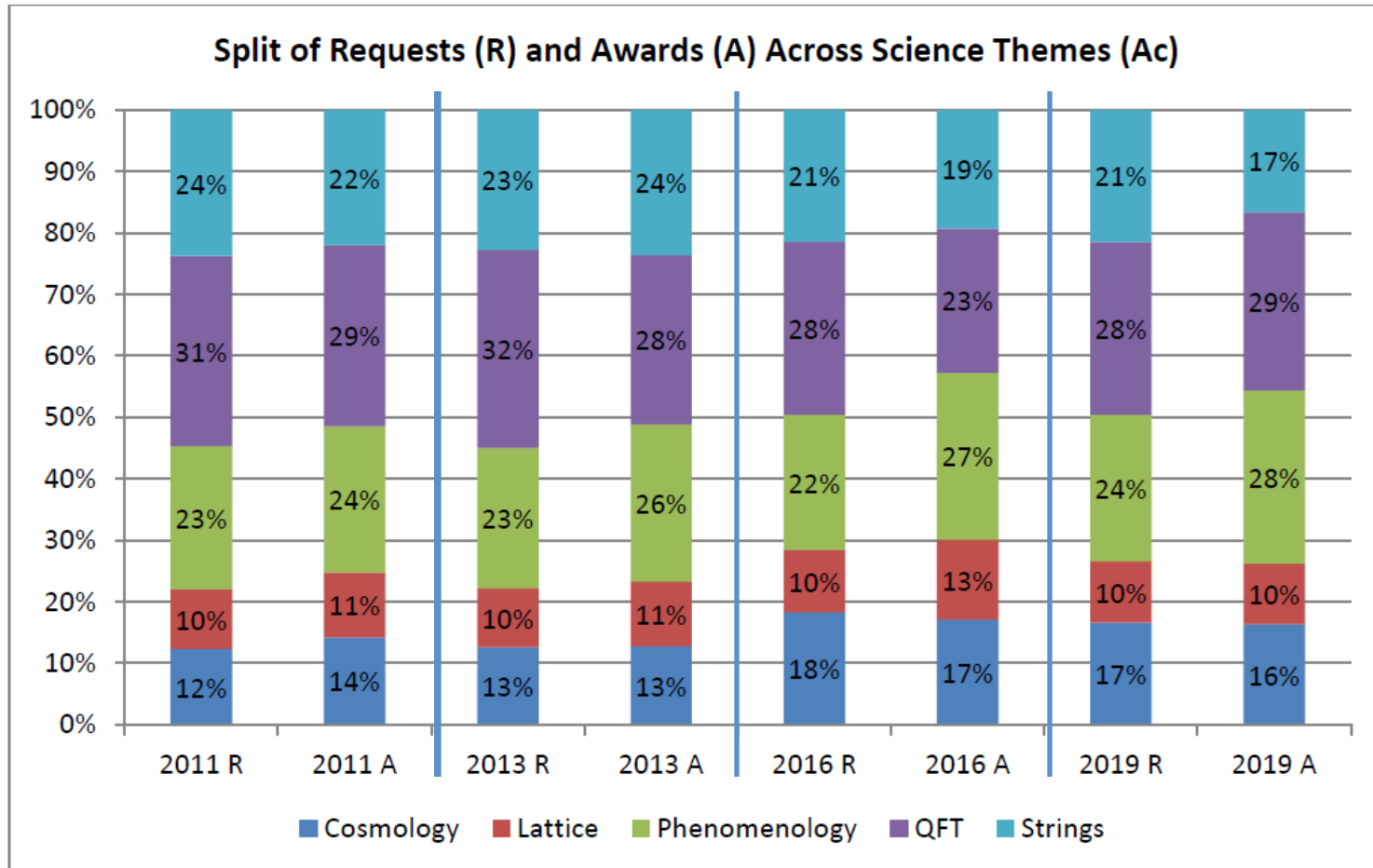
We sought to remove academics at “level 1” above the naïve funding line to support “level 3 & 4” below the line:

14 more Science Areas received at least some funding
7 below the line received 2 years of RA support.

The panel tried very hard to be fair and supportive of the whole UK theory community.

WORRY: is loss of a balanced academic pathway.. People who concentrate on Heads of Department, outreach, teaching for 3 years are losing funding...

Balance of Programme



There are no big motions here – IPPP is now included – changes at level of one RA etc per area... QFT has grown as a result of scattering amplitude techniques embedding into departments and the formal area moving away from AdS/CFT...

THE TOTAL PERSPECTIVE VORTEX

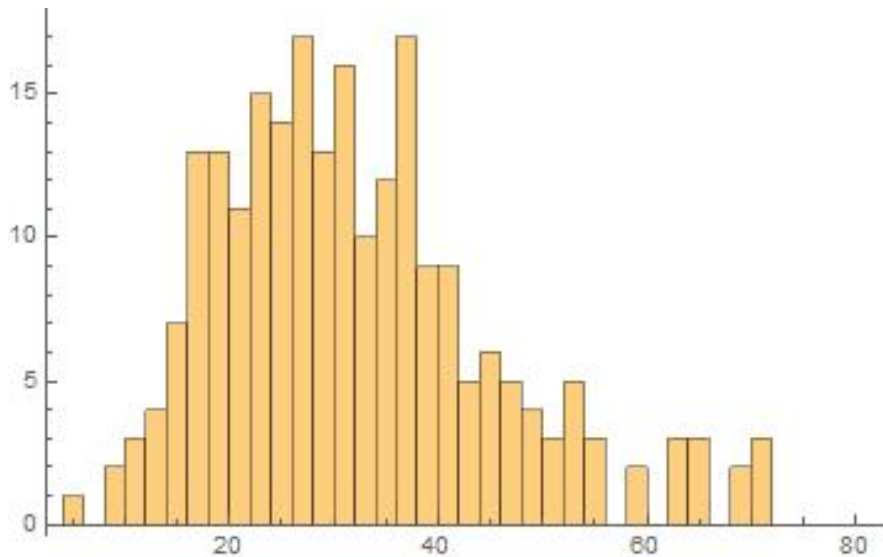
We only funded 2/3 of the applying academics... What does bottom third mean in UK Theory?

VERY IMPORTANT: I'm about to show some data based on metrics... this is not what the panel does!!! The panel uses academic judgement of cases but I can't display that as histograms!!!

Nevertheless it shows how tough the situation is... the data here is just my brief trawl through INSPIRE.. I throw out et al papers and reviews...



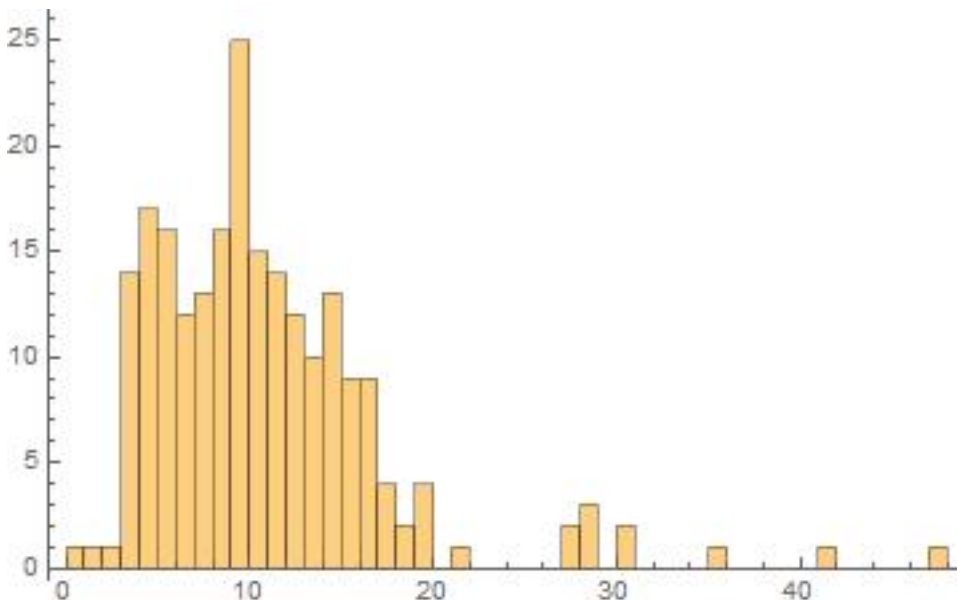
What Does Bottom Third Mean In UK Theory?



This is the h number distribution of applicants (this one includes everything)...

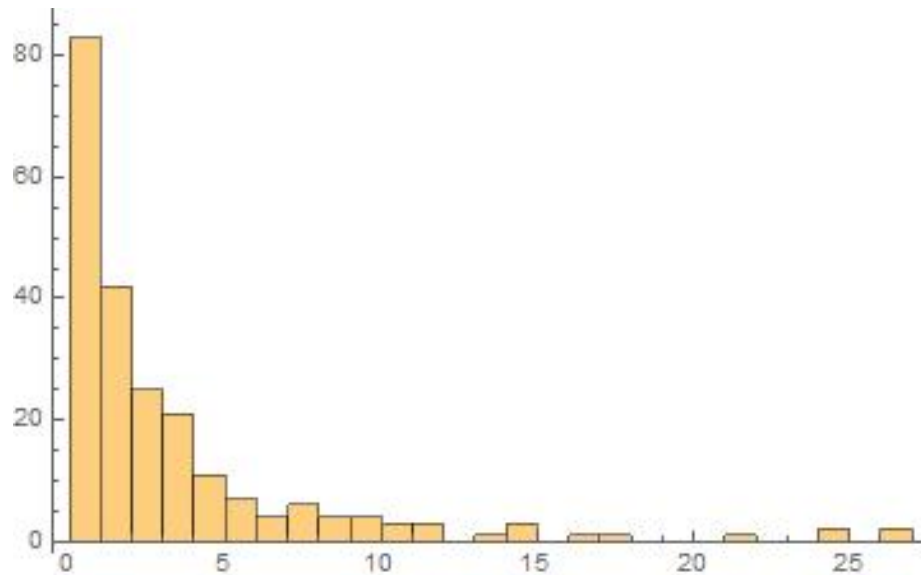
30s is the norm (average 33) with younger up and coming people in the 20s...

Only 40+ in mid-career makes you very special...



This is number of papers published per year in the grant period... being below 2 a year looks perilous... mean is 10 in 3 years

BUT I CONTRIBUTED TO STARTING A FIELD???



This is the number of people who have written x papers with more than 250 citations...

225 people have one over 250

98 people have one over 400

78 have one over 500

Pretty much you have to have made a splash at some point to have got a job...

More relevant:

42 people have written papers >250 cites in the last 10 years

(Note the PPGP(T) panel theorists have written 24 250+ cite papers)

So if you

- * have an h in the 30s (probably near 40 when you retire)
- * have written a (few) 300+ cite paper 15 years ago
- * write 3 papers a year...

.... You don't hugely stand out ☹... funding then depends on your Science Area average and your last 3-6 years or so record...

Obviously this is DAFT and just reflects the lack of money.... A point the panel never ceases to push up towards government...

(Do tell your MP that Physics contributes 8.5% of the UK economy (IoP '12)
And 44% of EU export revenue (EPS '19)...))

But almost everyone agrees academics should take the hit to their pride to fund young RAs.....

IPPP

UK Strength. Strongly supported by panel... but very hard to maintain teaching buy outs in current climate + tougher competition for RAs led to

Total Award is down 8.7%

Virtual Centre Bids kick started by small funding awards

KCL	Strings/QFT	Neil Lambert	£20k/year
Nottingham	Astroparticle	Tony Padilla	£20k/ year
Swansea	Lattice	Simon Hands	£6.5k / year

Must: show ability to match funds
make use of INI and aid IPPP annual conference
represent their communities

Conclusion

Increased the number of RAs 40 -> 43

Funded the same number of academics (150) as in '16 but at a lower 8% fEC rate
(but Universities are getting more overheads)
(but 1/3 academics who applied were not funded)

We have seed funded Virtual centres in strings/QFT, astroparticle & lattice

STFC/Science Board agreed to live with a 4% overspend to allow this.

This is a really tough period for panel members, with dropping funds tensioned against a rising academic cohort: we have honestly tried to balance different views in the community & to support the best science as we collectively see it.