



U.S. DEPARTMENT OF
ENERGY

Office of
Science

HEP Comparative Grant Review Outcomes

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Why Comparative Review?

- **The goal of this effort is to improve the overall quality and efficacy of the HEP research program by identifying the best proposals.**
 - Program Managers feel the need to directly compare groups working in the same area to optimize their programs, particularly in an era of tight research budgets
 - General concerns about fairness of funding distribution across the program.
 - Allows for better alignment of research program with priorities
- **This change in process has been recommended by several DOE advisory committees, most recently the 2010 HEP Committee of Visitors.**

General Remarks

- **Eligibility**

- Not just for existing DOE HEP groups
 - New grant applications welcome
 - However, proposal must be for scope not funded elsewhere
 - Of 232 PIs who were reviewed, 71 were not funded by DOE in FY11

- **Proposal Rules**

- There were hard page limits + other requirements
 - Proposals not respecting the page limits or other requirements were NOT reviewed
 - 7 proposals declined without review for this reason
 - 2 were missing required budget sheets
 - 1 was outside scope of HEP
 - 2 were withdrawn
- PIs with proposals that were rejected for “technical” reasons could re-submit to general DOE/SC solicitation



Comparative Review Timeline

- **All proposals to HEP by December**
 - Timely turn-around needed on mail reviews (over holidays)
- **Review panels set for Jan 19-27 (1 panel/day).**
- **Estimated and actual # of proposals rec'd (new + “renewal”):**
 - Theory: est. 25 proposals [actual : 40]
 - Technology R&D (incl. detector R&D): 20 [actual : 34]
 - Cosmic Frontier :13; Intensity : 12; Energy: 20 [actual: 10/20/29]

Total of 104 distinct proposals, 15 with multiple research thrusts
- **HEP PMs met in February to assess reviews and decide funding.**
 - Fortunately FY2012 budget was resolved by then
- **New awards issued to Chicago procurement by ~early March. for May 1 start date. Some are starting a bit later.**

Panel Process

- **Five panels with 4-16 panelists met for 1 (or 2) days to consider all proposals submitted in a given topic area**
- **Most reviews were “mail+panel” (except Intensity Frontier)**
 - Detector R&D (8 proposals) was done by mail review only
- **Panelists considered mail reviews and then discussed each proposal**
 - Lead panelist was also asked to write a review
 - Other panelists were invited but not required to write a review
- **Full discussion of each proposal, individual Pis, and ranking**
 - But no consensus report
 - All panelists were asked to submit their individual rankings and commentary to DOE by email
 - “if it was **your** money, who would you support?”



Comments on Review Process I

- **Generally very useful to have head-to-head reviews of PIs working in similar areas, particularly for large grants.**
 - **Lots of discussion of relative strengths and weaknesses of individual proposals and PIs**
 - In some cases (e.g. Theory, Technology R&D) the metrics of success/impact are clear and agreed to:
 - merit and relevance of proposed work
 - invited presentations, publications, citations, h-index
 - mentoring and track-record of students and postdocs
 - In other cases (e.g. Experiment) there are other factors :
 - contributions to operations and research infrastructure of exp'ts
 - synergy and collaboration within group (as appropriate)
 - alignment with programmatic priorities
 - **All of these factors weigh into final funding decisions**
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Comments on Review Process II

- **“Grade Inflation”**

- Essentially all proposals/PIs rated good/very good or above
 - Probably true on an absolute scale, but need finer distinctions
 - Asked reviewers to rate each PI in quintiles (bottom 20%: 20-40%: 40-60%: 60-80%: top 20%) relative to other active HEP researchers.
 - This distribution was still skewed to the high end

- **“Umbrella” Grants**

- Historically ~30% of HEP proposals have multiple research thrusts
 - Some were voluntarily (by PIs) broken into separate proposals for the purpose of this review
- The remaining 15 “umbrellas” were broken (by hand) into their component pieces and reviewed by separate panels
 - Reviewers were also asked to evaluate benefits of larger group grant
 - In most (not all) cases there was seen to be little tangible benefit



Comments on Review Process III

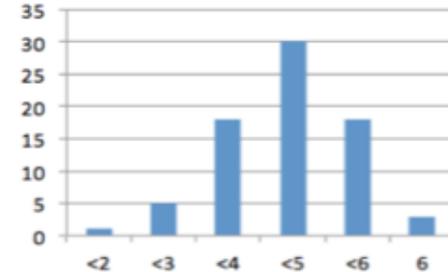
- **Junior Faculty**

- New academic faculty encouraged to apply to DOE Early Career (EC) program. This year's winners will be announced in April.
- However, EC program is very competitive (~10% success rate), so most jr. faculty will need to apply for “regular” grant support
- This year they were invited to do so through Comparative Review (even if their home institution's grant was not up for review)
- Funded about 15 of these (typically 2nd or 3rd year faculty).
 - Grant period is typically 1 or 2 years to “synch up” with HEP group grant at home institution
- Also some funded through HEP group grant

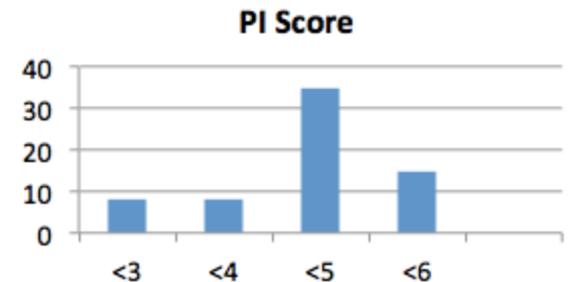
Peer Review Scores

- **Distribution of mail review scores: Theory vs Energy Frontier**
- **Theorists seem to be better at calibrating peer reviews**

- **Mail-In Reviews showed a remarkable consistency**
 - Very few cases had large variances
- **Panelists reviewed 3-6 proposals each**
 - Trying to balance the number of PI per panelists
- **37 Proposals, 66 PI**
 - Scoring evenly distributed
 - 3 PI 6
 - 18 PI between 5 and 6
 - 30 PI between 4 and 5
 - 18 PI between 3 and 4
 - 5 PI between 2 and 3
 - 1 PI below 2



- **Mail-In Reviews showed large variances**
 - Few cases had consistent scoring
- **Panelists reviewed 3-4 proposals each**
- **27 Proposals, 66 PI**
 - Scoring not too evenly distributed
 - 0 PI above 6
 - 15 PI between 5 and 6
 - 35 PI between 4 and 5
 - 8 PI between 3 and 4
 - 8 PI between 2 and 3
 - 0 PI below 2



Review Data by Proposal

	Energy	Intensity	Cosmic	Theory	Tech R&D*	HEP Total
Received	30	20	11	40	25+9	136
Declined ⁺ or Withdrawn	4	2	1	4	3+0	14
Reviewed	27	18	10	36	22+9	122
Funded	21	15	6	22	15+6	85
“Success Rate” (%)	78	83	60	61	68/75	70

*First number is Accel R&D, second is Detector R&D

+Proposals declined without review, see Slide 3

NOTES:

- **Single proposals with multiple research thrusts are counted multiple times (1 /thrust)**
- “Success Rate” is = # Funded/ # Reviewed.
- Most proposals are not fully funded at requested level.
- About ½ of the proposals reviewed were from research groups that received DOE HEP funding in FY11.



Review Data by PI

	Energy	Intensity	Cosmic	Theory	Tech R&D*	HEP Total
Received	71	37	21	78	35+11	253
Declined ⁺ or Withdrawn	7	2	1	6	5+0	21
Reviewed	64	35	20	72	30+11	232
Funded	50	26	13	45	19+9	162
“Success Rate” (%)	78	74	65	63	63/81	70

*First number is Accel R&D, second is Detector R&D

+Proposals declined without review, see Slide 3

NOTES:

- “Success Rate” is = # Funded/ # Reviewed.
- Success Rate for New (to DOE) PIs was about 50% on average. Success Rate for Existing DOE PIs was about 75% on average.
- New proposals from PIs in 1st year of academic appointment were not funded
- Most (but not all) PIs who are funded, are funded at requested effort level.

Funding Guidelines

- HEP Program Managers discussed various mechanisms for optimizing funding levels in response to the review outcomes.
- We determined the following guidelines which were sent to all PI's in the comparative review:
 - Academic faculty summer salary support limited to 2 mos.
 - Individual salary costs limited (pro-rated as necessary)
 - Support for some specific activities is ramped out
 - Research faculty/postdocs who are no longer supported effective with this action can be allowed phase-out. Duration of phase-out period should be discussed with the grant monitor.



Comment on Senior Research Scientists

- **From HEP “Dear Colleague” letter, Dec 2009:**
 - “We do not, in general, favor open-ended support for long-term research scientists on grants (as opposed to support for graduate students or post-docs), but we do consider each individual case on its merits”
 - “Support for academic research staff depends on the quality of their work, the overall quality of the proposal and its alignment with programmatic goals, and overall cost considerations.”
 - “Proposals which do not review well will likely be supported at a level significantly below the budget request, if at all. This has serious impacts on research staff who derive some or all of their support from the grant. As managers of the grant, PIs need to be cognizant of these realities and have contingency plans for supporting or transitioning research staff if their new or renewal proposal is not funded at a level sufficient to retain them. “



Comment on Senior Research Scientists II

- **About 20 Senior Research Scientists / Research Faculty were included in 2012 Comparative Review research proposals**
 - Dominantly in Energy Frontier
 - Also several in Accelerator R&D but do not have full stats on these
- **In general they did not review well (11 of 20 dropped)**
 - Many regarded as not making unique or particularly compelling contributions commensurate with their positions (e.g., “doing work that could be done by a postdoc”)
- **Breakdown by type of work:**
 - 3 on LHC experiments
 - 5 on CDF/D0 (planning to migrate to LHC but not done yet)
 - 1 detector R&D
 - 2 positions eliminated because PI was dropped



Lessons Learned (Initial)

- **Many questions about the new proposal process**
 - Developed FAQ. Will iterate and update this for next round
- **Many questions about the review process**
 - Will consider spelling this out on the HEP website
- **Many questions (+more) about the outcomes**
 - We are working with Pis to minimize adverse impacts and avoid unintended outcomes
 - Will work with LHC and FNAL Ops managers to better understand impacts of people who have an “operations focus”
- **Groups that were “borderline” before did not necessarily get that message**
- **Sr Research Faculty need to have strong justification for continued support**

Summary

- **DOE/HEP has undertaken Comparative Reviews (Round 1)**
 - New process but ran relatively smoothly from our perspective
 - Goal is better-optimized, more efficient program
 - Time will tell, but we think we have overall better outcomes
 - Large number of new (to DOE) PIs applied and about half are being supported
 - Existing PIs mostly reviewed well but there is some turn-over
 - Total number of PIs ~constant but changing demographics:
 - Several new junior faculty supported
 - Some senior faculty no longer supported
 - Several senior research faculty no longer supported
 - Expect total FTEs supported to be down somewhat
- **Solicitation for 2013 Comparative Reviews out this summer**