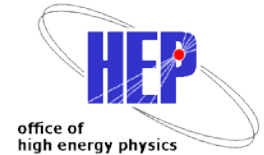




U.S. DEPARTMENT OF
ENERGY

Office of
Science



FY2014 HEP University Comparative Review Statistics and Lessons Learned

**High Energy Physics Advisory Panel (HEPAP)
Doubletree Bethesda, Maryland
March 13 – 14, 2014**

**Glen Crawford
Division Director, Research and Technology Division
Office of High Energy Physics
Office of Science, U.S. Department of Energy**

**FINANCIAL ASSISTANCE
FUNDING OPPORTUNITY ANNOUNCEMENT**



**U. S. Department of Energy
Office of Science
Office of High Energy Physics**

FY2014 Research Opportunities in High Energy Physics

**Funding Opportunity Number: DE-FOA-0000948
Announcement Type: Initial
CFDA Number: 81.049**

Issue Date:	June 14, 2013
Letter of Intent Due Date:	July 15, 2013, at 5 PM Eastern Time (A Letter of Intent is encouraged)
Application Due Date:	September 9, 2013, at 11:59 PM Eastern Time

FY 2014 HEP COMPARATIVE REVIEW PROCESS

FY14 Submitted Proposals

- For the FY 2014 cycle, 141 proposals requesting support totaling \$196.138M in one or more of the 6 HEP subprograms were received by the September 9, 2013 deadline in response to the Funding Opportunity Announcement (FOA) “FY 2014 Research Opportunities in High Energy Physics” [DE-FOA-0000948].
- 8 proposals were withdrawn by the respective sponsoring institutions:
 - 7 were duplicate submissions + 1 was withdrawn at request of the PI
- After pre-screening all incoming proposals for responsiveness to the subprogram descriptions and for compliance with the proposal requirements, 9 were declined before the competition:
 - 2 proposals declined without review for reasons of exceeding page limits
 - hard page limits and other requirements for application are given in FOA.
Proposals not respecting the page limits or other requirements were NOT reviewed.
 - 3 were outside the scope of DOE/HEP supported research
 - 4 proposals were non-responsive
 - 3 proposals on development of future earth and human ecosystems (\$0 requested)
 - 1 proposal on starting a non-profit organization (\$0 requested)
- PIs with proposals that were rejected for “technical” reasons could re-submit to general DOE/SC solicitation

FY14 Reviewers & Panels

- For the FY14 HEP Comparative Review process, 124 proposals were reviewed, evaluated and discussed by several panels of experts who met in the:

Research Subprogram	Panel Deliberations	# of Total Proposals Reviewed <small>[includes proposals containing multiple subprograms]</small>
Intensity Frontier	November 12-13, 2013	26
HEP Theory	November 13-15, 2013	33
Accelerator Science and Technology R&D	November 14-15, 2013	29
Particle Detector R&D	November 18-19, 2013	14
Energy Frontier	November 19-20, 2013	20
Cosmic Frontier	November 20-22, 2013	28

- 16 of the proposals requested research support from two or more of the six sub-programs, e.g. “umbrella” proposals, in which case the proposal was sent in its entirety to all relevant panels.
 - However, the panels were asked to explicitly compare and rank only the section(s) of the proposal relevant to the sub-program they were reviewing.
- Each proposal which satisfied the requirements of the solicitation was sent out for review by at least three experts.
 - 127 reviewers participated in the review process. In cases where there were proposals on similar topics, reviewers were sent multiple proposals.
 - 571 reviews were completed with an average 4.6 reviews per proposal

FY14 Review Data – by Proposal

	HEP Subprogram						HEP Total
	Energy	Intensity	Cosmic	Theory	Acc. R&D	Det. R&D	
Received	20	26	29	33	31	16	129
Declined Without Review	0	0	1	0	2	2	5
Reviewed	20 (7)	26 (11)	28 (14)	33 (17)	29 (20)	14 (4)	124 (71)
Funded	16 (4)	17 (3)	19 (5)	16 (1)	11 (4)	7 (0)	60 ^(a) (17)
Declined	4 (3)	9 (8)	9 (9)	17 (16)	18 (16)	7 (4)	62 (54)
"Success Rate" (%) (Previous/New)	80	65	68	48	38	50	48 (81/24)

NOTES:

- Single proposals with multiple research thrusts are counted multiple times [1 /thrust]
- () indicates number of proposals from research PI/groups that did not receive DOE HEP funding in FY13.
- "Success Rate" is = # Funded/ # Reviewed.
- Most proposals are not fully funded at the "requested" level.
- About 43% of the proposals reviewed were from research groups that received DOE HEP funding in FY13.
- Overall success rate of reviewed proposals for previously (newly) funded groups was 81% (24%).
- *For Ref:* FY13 Comp. Review proposal success rate was 62%; previously (newly) funded was 78% (34%).

^(a) Total does not include 2 proposals currently 'on-hold' pending funding decisions from separate federal funding agency.

FY14 Declined Proposals

- **Based on the reviewers' assessments, the comparison and ranking of the proposals by the panel(s) within the subprogram(s), evaluations of the needs of the HEP research program by the respective program managers, the potential impact of the proposed work, the proposals' responsiveness to the FY14 HEP Comparative Review FOA:**
 - **62 proposals were recommended for declination**
 - **declinations primarily due to**
 - **proposals and/or senior investigators received poor merit reviews and/or reviewers noted that the proposed research would not have high impact when compared to others in the same subprogram**
 - **proposals were seeking support for research currently not within the DOE/HEP program**
 - **budgetary constraints**
 - **proposals were from senior investigators reviewed poorly in the FY13 comparative review and hence, not supported in a FY13 grant**

FY14 Review Data — by Senior Investigator

	HEP Subprogram						HEP Total
	Energy	Intensity	Cosmic	Theory	Acc. R&D	Det. R&D	
Received	51	57	40	89	40	29	285
Declined Without Review	0	0	2	0	2	4	8
Reviewed	51 (9)	57 (20)	38 (19)	89 (21)	38 (24)	25 (6)	277 (97)
Funded	46 (6)	41 (9)	25 (6)	62 (5)	11 (4)	14 (2)	178 (31)
Declined	5 (3)	16 (11)	13 (13)	27 (16)	27 (20)	11 (4)	99 (66)
"Success Rate" (%) (Previous/New)	90	72	66	70	29	56	64 (82/32)

NOTES:

- () indicates number of senior investigators that did not receive DOE HEP funding in FY13.
- "Success Rate" is = # Funded/ # Reviewed.
- Overall success rate for previously (newly) funded DOE HEP PIs was 82% (32%).
- *For Ref:* FY13 Comp. Review overall PI success rate was 73%; previously (newly) funded PIs was 85% (35%).

FY14 Review Data

Jr. Faculty and Research Scientists (RS)

	Junior Faculty		Research Scientists	
	Total # Jr. Faculty Reviewed (New)	# Jr. Faculty Funded (New)	Total # Res. Scientists Reviewed (New)	# Res. Scientists Funded (New)
Energy Frontier	11 (8)	8 (6)	8 (0)	6 ^(a) (0)
Intensity Frontier	14 (7)	11 (4)	9 (2)	5 (0)
Cosmic Frontier	9 ^(b) (9)	1 (1)	9 (0)	7 (0)
Theory	4 (4)	2 (2)	1 (1)	0 (0)
Accelerator R&D	2 (2)	1 (1)	37 ^(c) (19)	9 (1)
Detector R&D	1 (1)	1 (1)	6 (3)	4 (1)
HEP Total:	41 (31)	24 (15)	70 (25)	31 (2)

NOTES:

- (a) DOE worked with US-CMS or US-ATLAS management and the university PIs to provide guidance on the scope and FTE levels related to Research Scientists prior to PI's submission of application to the FOA. (Of the 2 RS not funded, 1 is planned to be supported in FY14 through the LHC Operations program.)
- (b) Several Jr. PIs did not review well due to not having an established track record and/or were not fully engaged in the collaboration model of the proposed experiment/DOE Cosmic Frontier research program.
- (c) Includes multiple proposals each with different research scope submitted by certain institutions, which contained multiple corresponding requests for support of the same RS.

FY14 Proposals vs. FY13 Status

	New Proposals		Efforts funded in FY13				Total
	Fund	Decline	Up	Flat	Down	No-Fund	
Energy Frontier	4	3	9	0	3	1	20
Intensity Frontier	3	8	7	1	6	1	26
Cosmic Frontier	5	9	8	2	4	0	28
Theory	1	16	1	1	13	1	33
Accelerator R&D	4	16	4	0	3	2	29
Detector R&D	0	4	4	0	3	3	14
HEP Total:	17	54	21	4	20	8	124

- HEP Total is weighted since single proposals with multiple research thrusts (“umbrella”) are counted multiple times [1 /thrust].
- New/Fund = HEP research effort was not funded at this institution in FY13 but is funded in FY14.
- New/Decline = HEP research effort was not funded at this institution in FY13 and is not funded in FY14.
- Up = FY14 funding level +2% or more compared to FY13.
- Flat = FY14 funding level within $\pm 2\%$ of FY13.
- Down = FY14 funding level -2% or more compared to FY13.
- No-Fund = No funding is provided in FY14. This effort was funded in FY13.

Proposal Tiers: Merit vs. Funding (Example Matrix)

- During a subpanel's closeout, after reviewing *all* proposals and *all* senior investigators, panels deliberated by
 - Categorizing proposals in 2-dimensional Tiers based on its: **Merit Review vs. Funding Request**
 - Treat the reasonableness of funding requests independent from the science merits

CLOSEOUT: PROPOSAL TIERS	Merit Tier 1 (Outstanding)	Merit Tier 2 (Above Average)	Merit Tier 3 (Average)	Merit Tier 4 (Below Average)	Merit Tier 5 (Poor)
Funding Tier 1 (require minimum budget adjustment)	University A	University D	University H		
Funding Tier 2 (require average budget adjustment)	University B University C	University E University F	University I University J University K University L	University O	
Funding Tier 3 (require maximum budget adjustment)		University G	University M University N		University Q <i>(e.g., term soft-landing)</i>
Tier 4: No Fund				University P	University R University S

- Panelists were asked to consider the level of support needed to accomplish research goals of each application
 - Make “comparisons”: are the *budget requests* submitted by the PIs reasonable and appropriate for carrying out the research when compared to other applications with similar scope?
 - No consensus was taken and members of panel encouraged to voice individual opinions (and noted)
 - the above matrix served as a 1st order guide when DOE PMs later made funding decisions

Full Funding of Multi-Year Grants

- On January 17, 2014, the President signed the 2014 Consolidated Appropriations Act (CAA): Section 310(D) requires full funding of multi-year grants and/or cooperative agreements received from academic institutions with total cost less than \$1M.
 - “Full funding” implies funds for the *entire award* for the proposal’s project period is obligated at the time the award is made, instead of funding year-by-year.
- **Logistics on full funding:**
 - Process applies to new, renewal, or supplemental grant awards that are made after the merit review process.
 - No other exemptions from this provision apply other than grants and cooperative agreements are of total cost less than \$1M – integrated over the project period approved for the proposal.
- **During the submission of a proposal along with conducting its merit review and making decisions on the award:**
 - There will be no change to how an applicant applies for a grant or cooperative agreement.
 - There will be no change to the merit review process.
 - There will be no change to DOE Program Managers requesting revised budgets from PIs.
- **DOE Program Managers (PM) will continue to have oversight of the research program by requiring PIs to submit an annual research performance progress report that must be approved by the PM prior to any funds being accessed by the PI the following year.**

FY14 Review Data — Full Forward Funding

Research Subprogram	# Proposals Reviewed	# Proposals Funded	# Multi-Year Grant Awards Fully Forward Funded (Period > 1 year)	\$k TOTAL: FY14 (1 st year of project period)	\$k TOTAL: FY14 (over <i>entire</i> multi-year project period for Fully Forward Funded grants)
Energy Frontier	20	16	1	113	230
Intensity Frontier	26	17	2	302	722
Cosmic Frontier	28	19	9	810	1,970
Theory	33	16	2	390	780
Accelerator R&D	29	11	7	1,330	2,910
Detector R&D	14	7	2	236	486
HEP Total:	124	60	23	3,181	7,098

NOTES:

- **# Multi-Year Grant Awards Fully Forward Funded** = total number of funded proposals that received a HEP comparative review grant where Section 310(D) of 2014 Consolidated Appropriations Act (CAA) applies. The approved project period for a grant is greater than 1 year.
- **\$k TOTAL: FY14 (1st year of project period)** = funds applied only towards the 1st year of the project period. Reflects the total amount allocated for up to 12-months of Fiscal Year 2014 for these multi-year grant awards.
- **\$k TOTAL: FY14 (over entire multi-year project period for Fully Forward Funded grants)** = total amount provided from the FY14 HEP budget for fully forward funded grants for the entire duration of the multi-year project period.
- **Section 310(D) of 2014 CAA applied to ~38% of the proposals funded in the FY14 HEP Comparative Review process.**
- **Difference between the last two columns provides a measure of the “effect” of FY14 fully forward funded HEP comparative review grant awards = \$3.917M total.**
- **For Ref:** Out of 124 proposals, total # of incoming multi-year proposals with *budget requests* over a project period < 1M\$ was 77 proposals.

Full Funding of Multi-Year Grants (cont.)

- SC program offices, including HEP, are aiming to carry out the transition in a way that minimizes impacts on the scientific community and the mission needs served by the office
 - For FY14 Comparative Review, during decision making process, DOE Program Managers adjusted the project period for the grant
 - *for e.g., award a grant with a 2-year project period versus 3-years*
 - Priority placed on supporting proposals and senior investigators for existing, on-going research projects
 - *new initiatives were considered for support if the proposal received high merit reviews and if research was aligned with DOE programmatic priorities*
 - Grant Monitors worked with other program managers to understand support levels for different subprograms in proposals with multiple research thrusts (“umbrella”)
- Transition to all DOE funded grants that satisfy the provisions for full forward funding is planned over the course of the next 3-5 years

LESSONS LEARNED

Lessons Learned (I)

- We consider the 2014 comparative peer review process successful in identifying proposals with highest scientific merit, impact, and potential (or elements thereof) in generally strong pool of applications.
 - We therefore will maintain the external peer review elements for the 2015 review cycle.
- Proposal submission, reviewer proposal assignments, input for reviews, and awarding grants – all managed through DOE’s Portfolio Analysis and Management System (PAMS)
 - Use of PAMS framework for the review process is new to DOE/HEP
 - FY14 Comp. Review was first large-scale FOA within DOE/SC that was managed using PAMS
 - DOE/HEP exercised system and provided valuable input to DOE/SC on debugging and long-term improvements — *for e.g.*,
 - introduce auto-save functionality for reviews, systematizing emails sent to reviewers on assignments, extending character limits for inputting merit reviews, ...
- For continual improvement of the process, we implemented lessons learned from the 2013 review process into the 2014 review — *for e.g.*,
 - Provided guidance to PIs in the FOA on preparing a better proposal narrative and on uniformly summarizing personnel distribution and budgets for proposals with multi-thrust research tasks
 - Provided more time to external reviewers to review proposals prior to convening the panel
 - Asking panel chairs to write brief summaries of panel deliberations for all proposals and PIs (as appropriate)
 - Strongly encourage panel reviewers to write any additional comments made during the panel deliberations into PAMS prior to adjourning

Lessons Learned (II)

- **To further improve the process, we are considering the following in 2015:**
 - As recommended by the 2013 HEP Committee of Visitors (COV), provide additional pages in a proposal for Research Scientists to describe scope of work
 - Reviewer's ranking of proposals/PIs provides a necessary "comparative evaluation" in the process and an essential [additional] input to DOE's process of optimizing resource allocations
 - Ranking functionality not available in PAMS, and in FY14, done manually through Excel worksheets; for FY15, considering use of automated feature in PeerNet for collecting data
- **Communications:**
 - We continue to communicate process/outcomes/impacts to the community:
 - "Snowmass-type" PI meetings with DOE PMs on the DOE program and guidance for overall process — considering holding next meeting in early Summer 2014; Feedback welcome.
 - Regularly updated FAQ available on HEP website
 - Continue interactions with HEPAP and DPF
 - When panels convene, individual Program Managers will continue to present DOE programmatic priorities, future directions, and the role of the panel in order to help guide panelists in their reviews.
 - In 2015, we will continue to involve reviewers with experience from either the 2012, 2013, or 2014 process
 - Questions?
 - Proposal technical areas: see contacts in FOA
 - Formatting, attachments, general — email to: SCHEPFOA@science.doe.gov

Closing Remarks

- **With the FY14 FOA, DOE/HEP completed the 3rd round of the annual university comparative review process**
- **With respect to the FY13 Comparative Review,**
 - **FY14 had fewer total proposals and PIs**
 - **124 proposals (FY14) vs. 162 proposals (FY13)**
 - **277 senior investigators (FY14) vs. 462 senior investigators (FY13)**
 - **primarily due to historic renewal pattern + break-up of umbrellas**
 - **Overall average proposal success rate somewhat lower**
 - **effort made to fund previously DOE-supported groups with high merit & high impact and those aligned with DOE's program and mission**
 - **Success rate for Sr. Research Scientists varied between each subprogram**
 - **in FY14, success rate was higher in Energy Frontier due to PIs indicating proper FTE levels in proposals between research and LHC Operations and/or Projects**
- **Larger fraction of new PIs and/or new proposals were reviewed relative to previous years**
 - **New-to-DOE proposals dominantly in Accelerator R&D, HEP Theory, and Cosmic Frontier**
- **FY14 HEP research budgets continued to be under pressure**
 - **In order to allow for planned DOE investments in new, upcoming projects**
 - **Impacts to both university and laboratory funding**
 - **Impacts to all three frontiers, Accelerator R&D, Detector R&D, and HEP Theory**
 - **Once a FY14 appropriations was reached, an additional ~\$3M was allocated to research allowing funding of ~10 'on-hold' proposals, which otherwise would have been declined.**

REFERENCE SLIDES

Comparative Review Criteria

(In descending order of importance)

1) Scientific and/or Technical Merit of the Project

For e.g., what is the likelihood of achieving valuable results? How might the results of the proposed research impact the direction, progress, and thinking in relevant scientific fields of research? How does the proposed research compare with other research in its field, both in terms of scientific and/or technical merit and originality?

Please comment individually on each senior investigator.

2) Appropriateness of the Proposed Method or Approach

For e.g., how logical and feasible is the research approach of each senior investigator?

Does the proposed research employ innovative concepts or methods? Are the conceptual framework, methods, and analyses well justified, adequately developed, and likely to lead to scientifically valid conclusions? Does the applicant recognize significant potential problems and consider alternative strategies?

3) Competency of Research Team and Adequacy of Available Resources

For e.g., what are the past performance and potential of each senior investigator? How well qualified is the research team to carry out the proposed research? Are the research environment and facilities adequate for performing the research? Does the proposed work take advantage of unique facilities and capabilities?

4) Reasonableness and Appropriateness of the Proposed Budget

Are the proposed resources and staffing levels adequate to carry out the proposed research?

Is the budget reasonable and appropriate for the scope?

5) Relevance to the mission of the DOE Office of High Energy Physics (HEP) program

How does the proposed research of each senior investigator contribute to the mission, science goals and programmatic priorities of the subprogram in which the application is being evaluated? Is it consistent with HEP's overall mission and priorities? How likely is it to impact the mission or direction of the HEP program?

6) General Comments and Overall Impression

Include any comments you may wish to make on the overall strengths and weaknesses of the proposal, especially as compared to other research efforts in this area. If there are significant or unique elements of the overall proposal, including institutional setting and resources, synergies with other relevant subprograms, or other broader considerations not noted above please include them here.