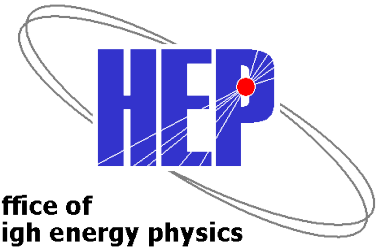




U.S. DEPARTMENT OF  
**ENERGY**

Office of  
Science



# Theory @ DOE-HEP

Simona Rolli

Program Manager

DOE Office of High Energy Physics

Snowmass on the Mississippi

August 5 2013

# Outline

- HEP Mission
- HEP Game Plan
  - Strategy
  - Budget
- Theory Funding trends
  - Labs
  - Universities
- Young Investigators: EC and Comparative Reviews
- Comparative Review
- Concluding Remarks
  - Or how to achieve Strength & Competitiveness in lean times...

# HEP Mission

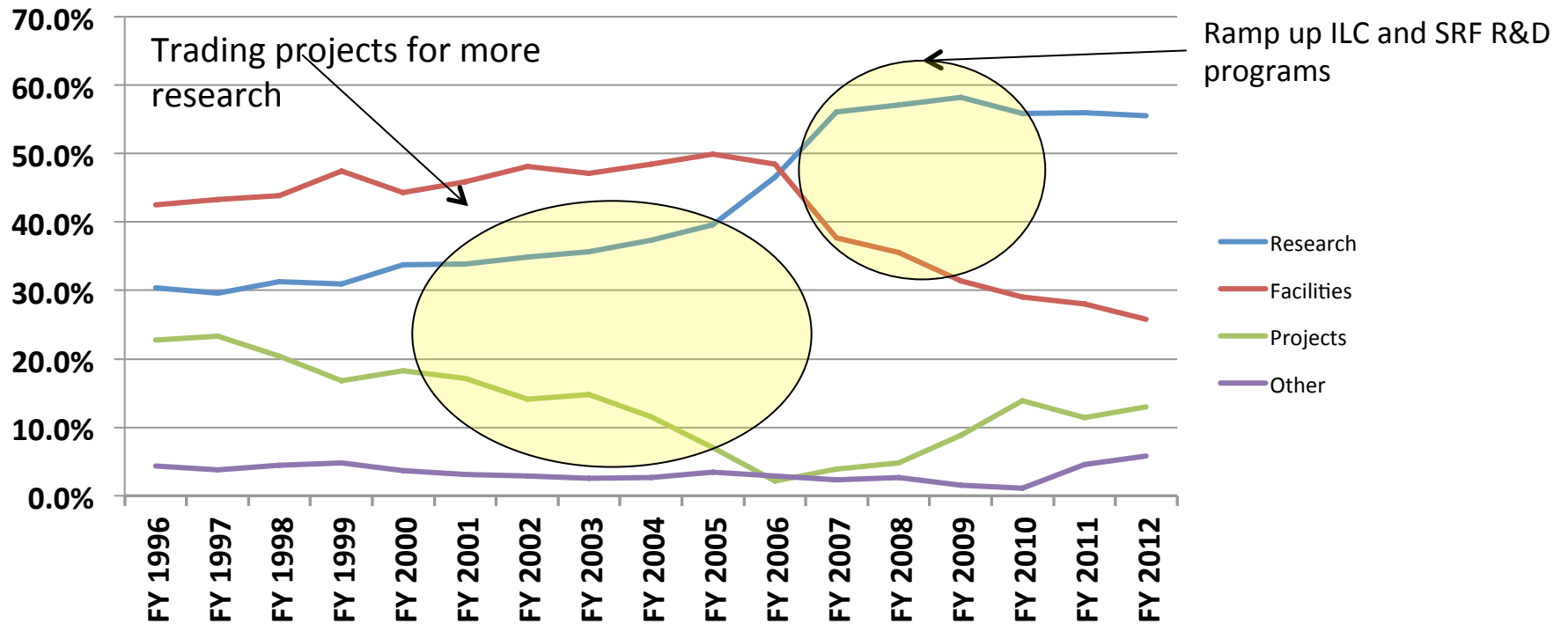
- **HEP's Mission:** To explore the most fundamental questions about the nature of the universe at the Cosmic, Intensity, and Energy Frontiers of scientific discovery, and to develop the tools and instrumentation that expand that research
- **HEP seeks answers to Big Questions:**
  - How does mass originate?
  - Why is the world matter and not anti-matter?
  - What is dark energy? Dark matter?
  - Do all the forces become one and on what scale?
  - What are the origins of the Universe?
- HEP offers high-impact research opportunities for small-scale collaborations at the Cosmic and Intensity Frontiers to full-blown international collaborations at the Energy Frontier.

# The HEP Game Plan

- 2008 P5 Recommendations
  - Three Frontiers
    - US one of the leaders in Energy and Cosmic
      - LHC & LHC Upgrades; Dark Matter & Dark Energy
    - US the leader in Intensity
      - Neutrino and Kaon/Muon programs
    - Strategic Program in Accelerator R&D
      - Society return...
- The HEP budget plan puts in place a comprehensive program across the three frontiers.
  - In five years,
    - NOvA, Belle-II, g-2 will be running on the Intensity Frontier.
    - Mu2e will be in commissioning preparing for first data.
    - The CMS and ATLAS detector upgrades will be installed at CERN.
    - DES will have completed its science program and new mid-scale spectroscopic instrument and DM-G2 should begin operation
    - The two big initiatives, LSST and LBNE, will be well underway.

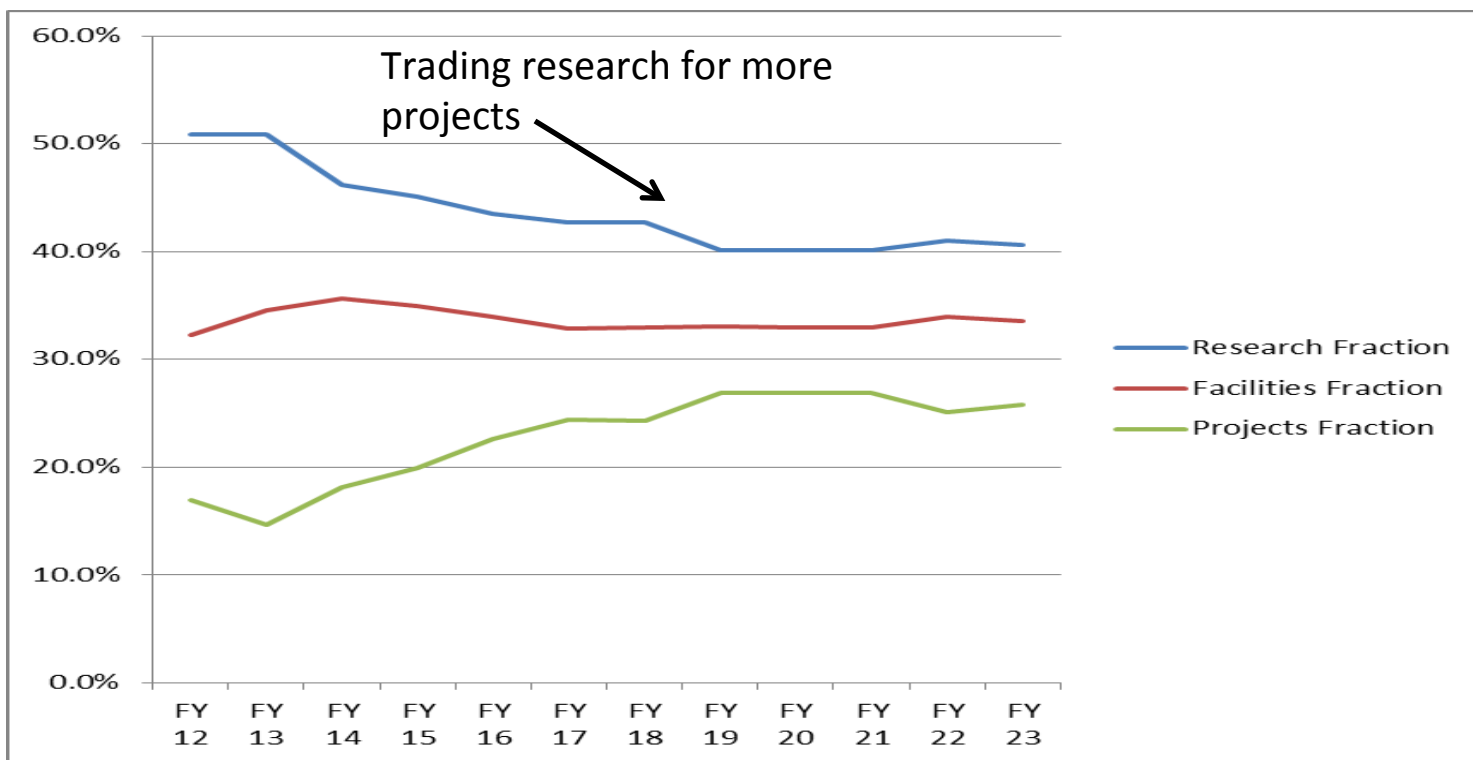


# Recent Funding Trends

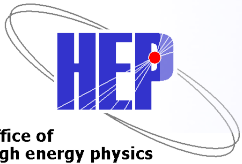


- In the late 90's the fraction of the budget devoted to projects was about 20%.
- Progress in many fields require new investments to produce new capabilities.
- The projects started in 2006 are coming to completion.
- New investments are needed to continue US leadership in well defined research areas.
- Possibilities for future funding growth are weak. Must make do with what we have.

# One Possible Future Scenario



- About 20% (relative) reduction in Research fraction over ~5 years.
  - *In order to address priorities, this will not be applied equally across Frontiers.*
- This necessarily implies reductions in scientific staffing. Some can migrate to Projects but other transitions are more difficult.
- We have requested labs to help manage this transition as gracefully as possible.



# FY14 Budget

- FY2014 budget philosophy was to enable new world-leading HEP capabilities in the U.S. through investments on all three frontiers
  - **Accomplished through ramp-down of existing Projects and Research**
  - **When we were not able to fully implement this approach, converted planned project funds to R&D: Research  $\Rightarrow$  ~~Projects~~  $\rightarrow$  Research**
    - Therefore, the FY14 Request shows *increases* for Research that are due to this added R&D “bump”, while Construction/project funding is only slightly increased
    - In the interim (since submission of FY14 Request), actual FY13 Research funding also increased because of inability to get projects started
    - Initial FY14 plan for Research will be down more than the originally advertised 2-3% relative to FY13
- Impact of these actions:
  - **Several new efforts are delayed: LBNE, LHC detector upgrades, 2<sup>nd</sup> Generation Dark Matter detectors**
  - **US leadership/partnership capabilities will be challenged by others**
  - **Workforce reductions at universities and labs**
- Key areas in FY2014 Request
  - **Maintaining forward progress on new projects via Construction and Research funding lines**



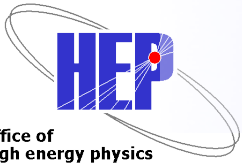
# FY12 vs FY14 Budget

Description	FY 2012 Actual	FY 2013 July Plan	FY 2014 Request	Explanation of Change
Energy Frontier Exp. Physics	159,997	148,164	154,687	Ramp-down of Tevatron Research
Intensity Frontier Exp. Physics	283,675	287,220	271,043	Completion of NOvA (MIE), partially offset by Fermi Ops
Cosmic Frontier Exp. Physics	71,940	78,943	99,080	Ramp-up of LSST
Theoretical and Computational Physics	66,965	66,398	62,870	Continuing reductions in Research
Advanced Technology R&D	157,106	131,885	122,453	Completion of ILC R&D
Accelerator Stewardship	2,850	3,132	9,931	FY14 includes Stewardship-related Research
SBIR/STTR	0	0	21,457	
Construction (Line Item)	28,000	11,781	35,000	Mostly Mu2e; no LBNE ramp-up
<b>Total, High Energy Physics:</b>	<b>770,533<sup>(a)</sup></b>	<b>727,523<sup>(a,c)</sup></b>	<b>776,521</b>	wrt FY12: Down -2% after SBIR correction wrt FY13: Up +3.6% after SBIR correction
<b>Ref: Office of Science (SC):</b>	<b>4,873,634</b>	<b>4,621,075<sup>(c)</sup></b>	<b>5,152,752</b>	

a) The FY 2012 Actual (FY13 CR) is reduced by \$20,327,000 (20,791,000) for SBIR/STTR

b) Reflects Sequestration



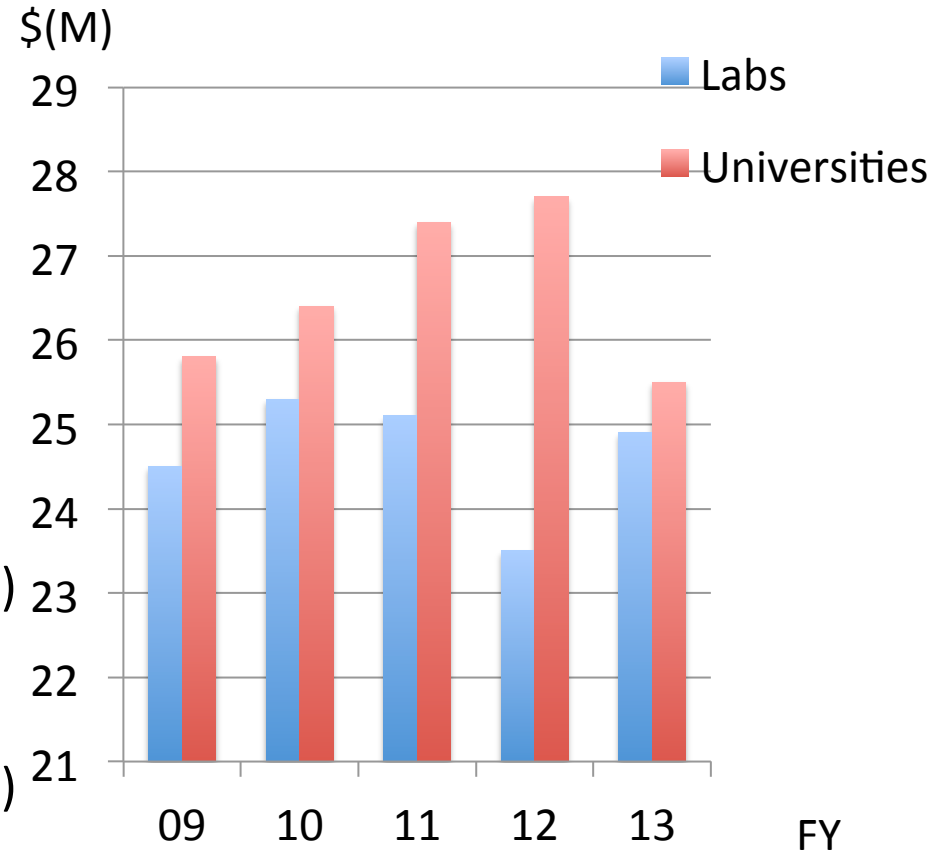


# HEP Research Funding for FY14

- The FY 2014 Request for HEP Research was \$384M, about a 6% increase compared to FY 2013, but \$26 million of this is planned to go to R&D for Dark Matter G2, DESI, and LHC upgrades.
- Our current FY 2014 planning is based on the House markup of the Energy and Water Appropriation which is overall slightly below the Request
  - The House mark directed HEP to move \$8 million to LBNE PED, \$2 million to SURF, and lower the overall HEP budget by \$4 million. The choice was made to take all of these reductions from Research due to our priority to increase Project spending.
- These two effects reduce Research to \$343M, about a 5% reduction w.r.t. FY 2013
- At the beginning of the year it is necessary to hold back funds for decisions to be made later in the year, such as the Early Career Program and other needs.
  - This results in an **approximately 6% reduction** relative to FY 2013 for the initial distribution of funds. This is the average effect on initial HEP research funding.
- There is some small variation in the impact to individual HEP subprograms, and program managers have the authority to provide more or less than the average reduction based on program priorities and the results of merit review.
- The House mark is a budget indicator but not the final word on FY 2014. When Congress passes a budget, there could be either an increase or a decrease in HEP research funding.

# Theory Budget

- 2009
  - Labs 24,500M
  - Universities 25,800M\*
- 2010
  - Labs 25,300M
  - Universities 26,350M \*
- 2011
  - Labs 25,100M
  - Universities 27,400M\*\* (26,972M)
- 2012
  - Labs 23,600M
  - Universities 27,700M \*\* (25,232M)
- 2013
  - Labs 24,950M
  - Universities 25,500 \*

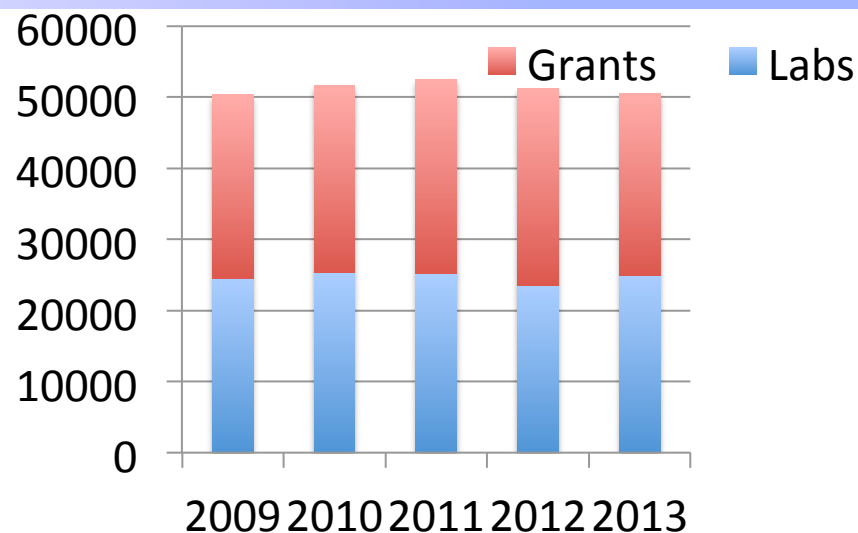


\* Does not include EC

\*\*Universities numbers include EC numbers w/o EC in parenthesis

# FTE/month Distribution (FY13)

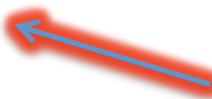
- Labs FTE
  - FNAL: 19 @ 12-months equivalent
  - SLAC: 9.5 @12-months equivalent
  - BNL: 8 @12-months equivalent
  - ANL: 5 @12-months equivalent
  - LBNL: 3.25 @12-months equivalent
  - TOTAL: 44.75 x 12 = **537 months-equivalent**
- Universities FTE:
  - FY12 Comp Rev : 42 @ 2-months equivalent ( 84 months)
  - FY13 Comp Rev : 102.25 @ 2-months equivalent ( 204.5)
  - FY14 Comp Rev : 70 @ 2-months equivalent ( 140)
  - TOTAL: 216.25 x 2 = **428.5 months-equivalent** ( not including EC recipients)



**47k/month per Lab / per FTE**

**56k/month per Grant/ per FTE (not including EC)**

# Budget and Comparative Reviews

- Two goals are accomplished with the Comp Reviews:
  - Comparatively evaluate all proposals at the same time
  - Synchronize the starting date of all grants to April 1<sup>st</sup>
    - Why April 1<sup>st</sup>? Blame the US ( dysfunctional) budget cycle
  - In the first three rounds → bridge funding
    - If the groups going into comp review in FY13 were funded at X level, in FY13 the level will be:  
$$X' = X * .96 - (X * .96) * Z$$


Bridge Funding: Z up to 25%
    - Cannot be avoided
    - Will be better starting in 2015

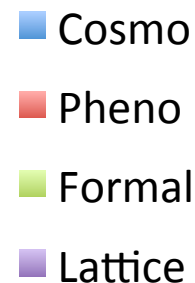
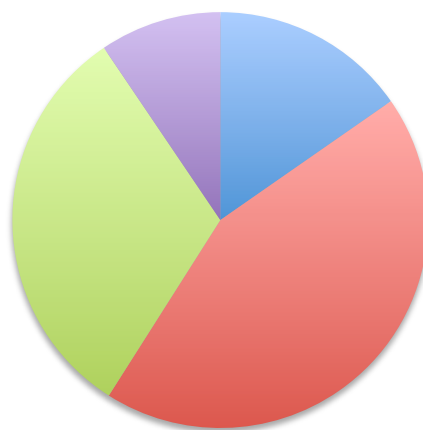
# Demographics Universities (FY12)

Postdocs: 95 FTE (0.43/PI)  
Students : 122 FTE (0.55/PI)

Total: 221 PI  
Cosmo 34  
Pheno 97  
Formal 70  
Lattice 20

- **Comp Rev 2012: 45 PI**
  - Cosmo 12
  - Pheno 16
  - Formal 16
  - Lattice 1
- **Comp Rev 2013:114 PI**
  - Cosmo: 16
  - Pheno 57
  - Formal: 31 passed
  - Lattice 14 passed
- **Comp Rev 2014: 58 PI**
  - Cosmo 6
  - Pheno 24
  - Lattice 5
  - Formal 23

PIs



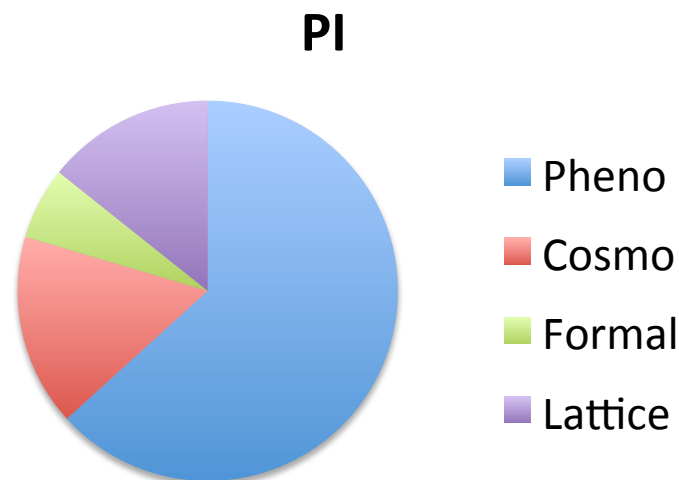
# Demographics Labs (FY12)

- **FNAL**
  - Astro 5 ( 3 RA)
  - Particle Physics (8 RA)
    - Pheno 12
    - Lattice 3
- **SLAC**
  - KIPAC 3 (1.5 FTE) (1.5 RA, 1.4 GS)
  - Particle Physics ( 7 RA, 7 GS)
    - Pheno 6
    - Formal 3 ( 2)
- **BNL ( 3 RA)**
  - Lattice 3 (+1)
  - Pheno 4
- **LBNL (2 RA)**
  - Pheno 3
- **ANL ( 4 RA)**
  - Pheno 6
  - Formal 1 (phased out)

Postdocs: 28.5 FTE (.58/PI)

Students: 7.4 FTE (0.15/PI)

Total: 49 PI  
Pheno 31  
Cosmo 8  
Lattice 7  
Formal 3

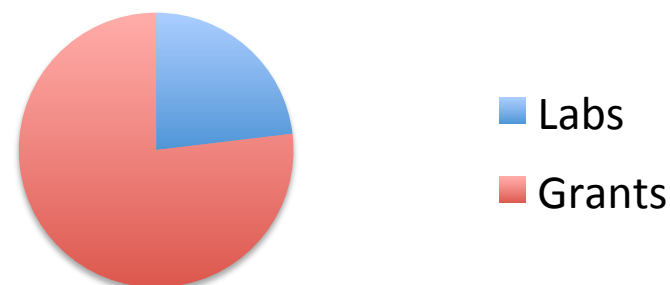


# Students and PD at Universities

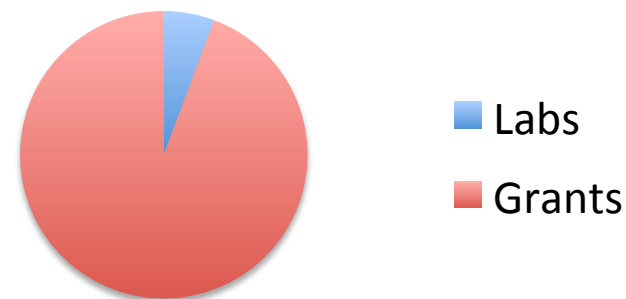
- Comp rev 2012 group
  - Students 30 FTE
  - PD 21.65 FTE
- Comp rev 2013 group
  - Students 52.6 FTE
  - PD 47.46 FTE
- Comp rev 2014 group
  - Students 39 FTE
  - PD 26.07 FTE

Total Students : 122 FTE  
Total Postdocs: 95 FTE

Postdocs

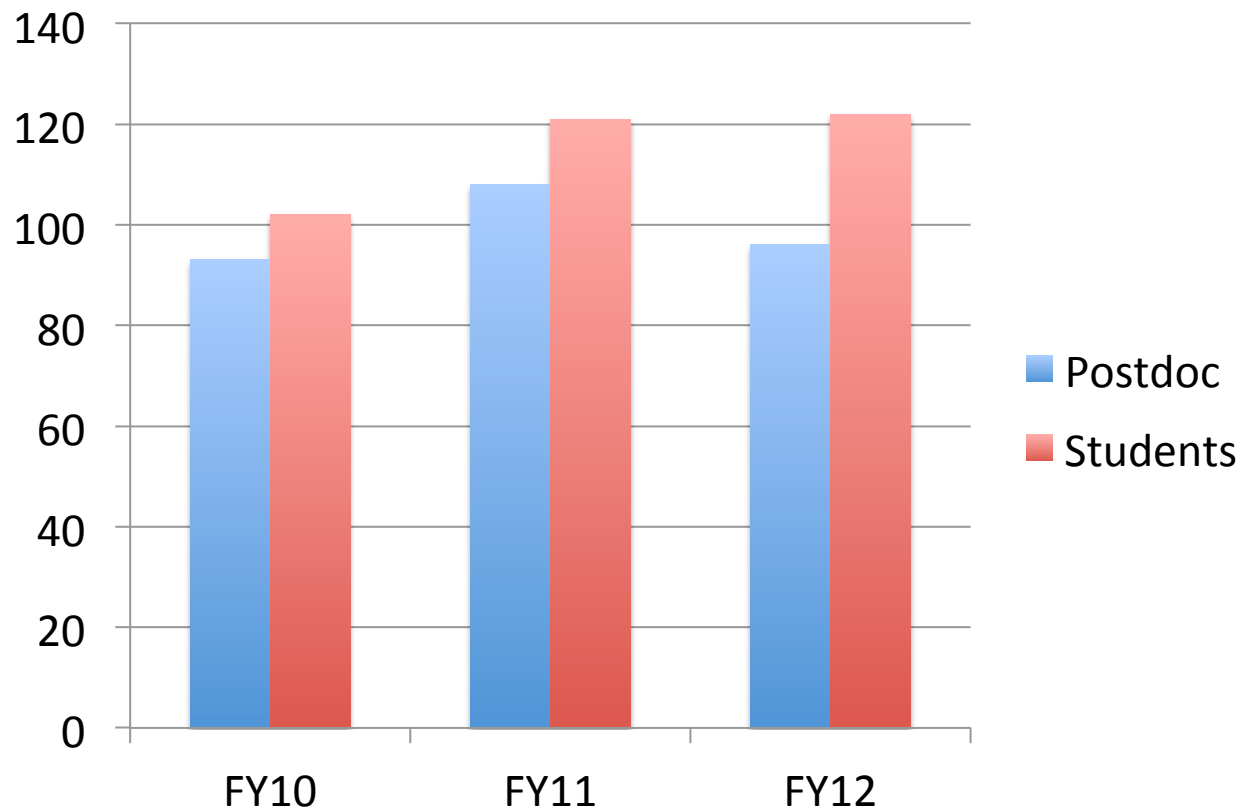


Students



Demographics numbers refer to FY12  
1FTE = 12 months

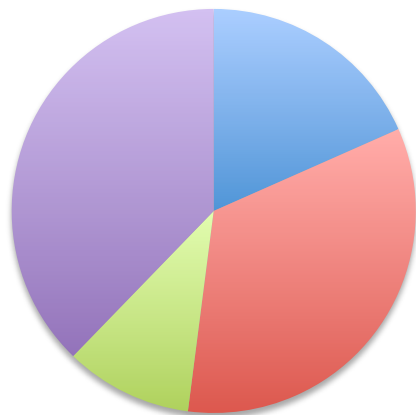
# University Students and PD Trends





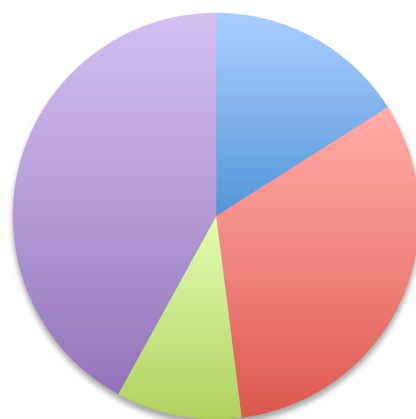
# Students and PD at Universities

## Students



- Cosmo
- Formal
- Lattice
- Phenomenology

## Postdocs



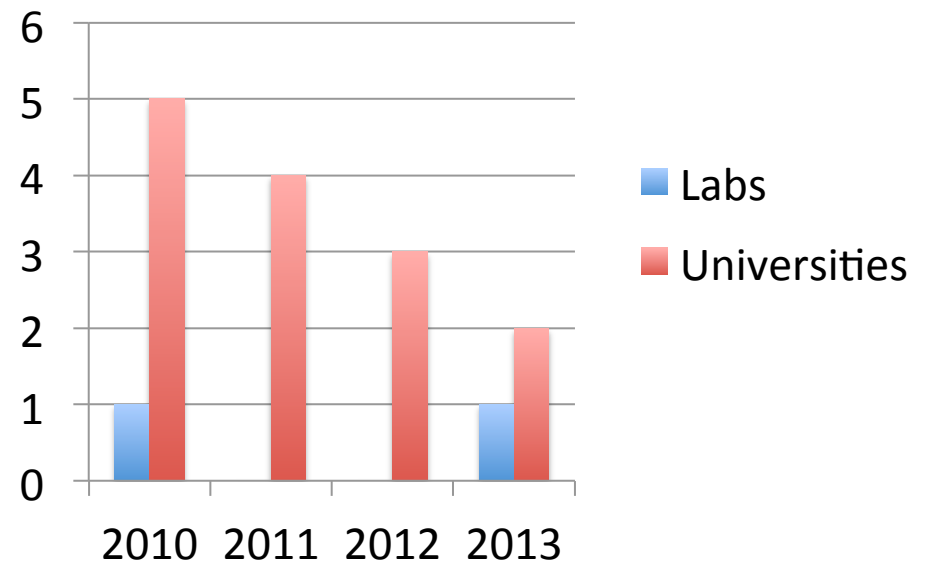
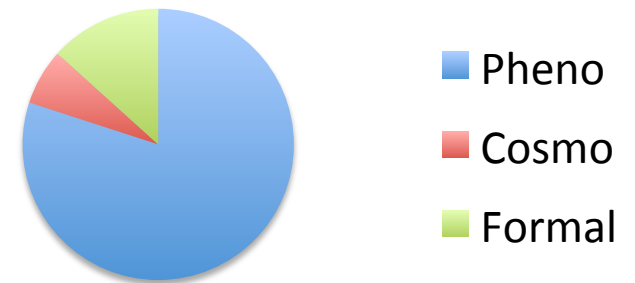
- Cosmo
- Formal
- Lattice
- Phenomenology

FY12

# Early Career Awards (16)

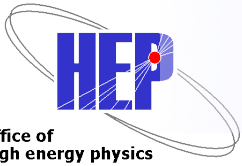
- 2010: 6 awards ( out of 43)
  - 5 Universities ( first 4 years from ARRA 5<sup>th</sup> year to be taken from theory budget)
  - 1 Lab ( fully forward funded for 5 years - ARRA) 500k
  - Pheno 6
- 2011 : 4 awards ( out of 45)
  - 4 Universities 600k
    - Pheno 2
    - Cosmo 1
    - Formal 1
- 2012 : 3 awards ( out of 23)
  - 3 Universities 450k
    - Formal 1
    - Pheno 2
- 2013: 3 awards ( out of 20)
  - 1 Lab 500k
  - 2 Universities 300k
  - 2 Pheno, 1 Cosmo

PI



**The most successful Frontier in the HEP Office!**

The award money is added every year and is shielded ( except 2010 5<sup>th</sup> yr)



# Early Career Demographics

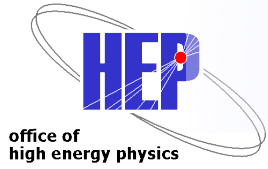
Subprogram	FY10 (L/U)	FY11 (L/U)	FY12 (L/U)	FY13 (L/U)	Total (L/U)
Energy	3 (1/2)	3 (1/2)	1 (0/1)	2 (0/2)	9 (2/7)
Intensity	2 (1/1)	1 (0/1)	3 (2/1)	1* (0/1)	7 (3/4)
Cosmic	2 (0/2)	3 (2/1)	3 (1/2)	2 (1/1)	10 (4/6)
Theory	6 (1/5)	4 (0/4)	3 (0/3)	3 (1/2)	16 (2/14)
Accelerator	1 (1/0)	2 (2/0)	2 (1/1)	1 (0/1)	6 (4/2)
<b>Proposals</b>	<b>154 (46/108)</b>	<b>128 (43/85)</b>	<b>89 (34/55)</b>	<b>78 (29/49)</b>	<b>449 (152/297)</b>
<b>HEP Awards</b>	<b>14 (8/6)</b>	<b>13 (5/8)</b>	<b>12 (4/8)</b>	<b>9 (2/7)</b>	<b>48 (19/29)</b>

\* Funded by Office of Basic Energy Sciences (BES) as an EPSCoR [Experimental Program to Stimulate Competitive Research] award with grant monitored by DOE HEP.

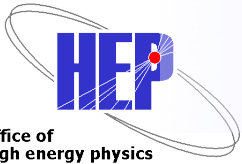
- **Early Career Research Program is very competitive (~10% success rate)**

# Comparative Review and Young Investigators

- In general young investigators (2<sup>nd</sup>-3<sup>rd</sup> year of tenure track career path) do well in the comparative review
  - Most of them have been funded
  - When there are other sources of funding (including startup) precedence is given to those who do not have other support
  - Submitting to both Comp Review and EC might weaken proposals
    - Office of Science does not accept the same proposal submitted to 2 different FOAs
    - NSF Career and EC/DOE grants cannot cover the same scope of work
      - But you can submit the same proposal to NSF and DOE → decide later which agency go with

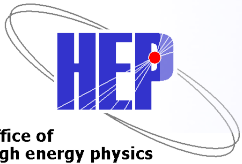


# Comparative Reviews



# Comparative Reviews

- DOE/HEP started undertaking a round of comparative grant reviews for existing research grants which were scheduled for renewal in FY2012 (+ any new proposals as desired)
  - Existing grants which did not renew in FY2012 (“continuations”) were not affected by this change in the 1<sup>st</sup> round
- Previously all HEP proposals responding to the general Office of Science (SC) call were individually peer-reviewed by independent experts.
- This change in process has been recommended by several DOE advisory committees, most recently the 2010 HEP Committee of Visitors (COV):
  - “In several of the cases that the panel read, proposal reviewers expressed negative views of the grant, but only outside of their formal responses. Coupled with the trend in the data towards very little changes in the funding levels over time, this suggests that grants are being evaluated based on the historical strength of the group rather than the current strength or productivity of the group. This is of particular concern when considering whether new investigators, new science, or high-risk projects can be competitive. Comparative reviews can be a powerful tool for addressing these issues and keeping the program in peak form.”
  - **Recommendation: Use comparative review panels on a regular basis.**
- Currently with the FY14 FOA, we are in 3<sup>rd</sup> round of annual comparative review process
- The goal of this effort is to improve the overall quality and efficacy of the HEP research program by identifying the best proposals with highest scientific impact and potential



# FY14 Review

- **DE-FOA-0000948**
  - Issued June 14, 2013
- **Six HEP research subprograms**
  - Energy, Intensity, and Cosmic Frontiers
  - HEP Theory
  - Accelerator Science and Technology R&D
  - Particle Detector R&D
- ☑ **Letter of Intent due July 15, 2013 by 5 PM Eastern Time**
  - ☑ **Deadline passed**
- **Final Proposal (*i.e.*, Application) deadline Sept. 9, 2013 by 11:59 PM Eastern Time**

FINANCIAL ASSISTANCE  
FUNDING OPPORTUNITY ANNOUNCEMENT

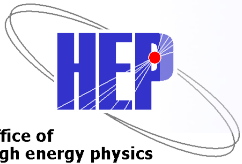


U. S. Department of Energy  
Office of Science  
Office of High Energy Physics

**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



# FY14 FAQ

## ■ **FAQ for FY14 HEP Comparative Review**

- available at:

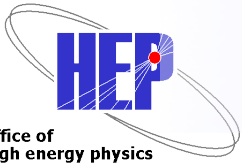
[http://science.energy.gov/~media/hep/pdf/files/pdfs/Funding%20Opportunities/FY14\\_Comp\\_Review\\_FAQ-UPDATED\\_JULY11\\_2013.pdf](http://science.energy.gov/~media/hep/pdf/files/pdfs/Funding%20Opportunities/FY14_Comp_Review_FAQ-UPDATED_JULY11_2013.pdf)

- updated: July 11, 2013

## ■ **In addition to information provided in FOA, FAQ addresses topics on:**

- Eligibility requirements
- Proposal types and scope of proposals being considered
- Guidance for new faculty members and those without current HEP grants
- Guidance for PIs with existing HEP grants
- Letter of Intent
- Proposal and Application requirements
- Budgets information, including guidance on scope of request(s)
- Information on overall scientific merit review process





# Logistics

## ■ Post-FOA deadline

- All applications are pre-screened for compliance to FOA, includes:
  - verification of senior investigator status
  - compliance with proposal requirements: *e.g.*, page limits, appendix material, use of correct DOE budget and budget justification forms, ...
  - responsive to subprogram descriptions
- Prior to submission, all PIs should carefully follow guidelines in FOA (and **read** FAQ)

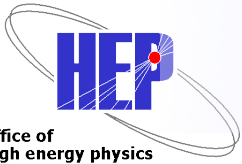
## ■ For review process, experts of panelists selected

- Each panelist assigned to review 3-5 proposals; any conflict of interest confirmed
  - minimum 3 reviews per proposal, additional reviewers added depending on the size of a research group and scope of research activities
  - size of each subprogram's panel and length of a panel meeting (in ~November 2013) depends on number of applications to review

## ■ Post-Review and panel deliberations

- Discussions at DOE OHEP on *each* proposal and *each* senior investigator in order to develop guidance and funding levels
  - in addition to reviews, solicit input from other DOE Program Managers & Grant Monitors
- PIs given [prioritized] guidance and funding levels (~mid-January 2014) and request Revised Budgets and Justifications

## ■ Funded grants to begin 1<sup>st</sup> year: on or about May 1, 2014



# HEP Research Activities Supported

## ■ What DOE supports

- Research efforts (mainly scientists) on R&D, experiment design, fabrication, data-taking, analysis-related activities
- Theory, simulations, phenomenology, computational studies
- Consider funding efforts that are in direct support of our experiments

## ■ Faculty support

- Assume 2-months summer support also “buys” their full research time throughout the academic year; and maximum of 2-months support from all federal sources
- Summer support should be adjusted according to % time they are on this effort
  - associated funding (post-docs, travel) is also adjusted accordingly

## ■ Research Scientists

- Support may be provided, but due to long-term expectations, need to consider case-by-case on merits: whether the roles and responsibilities are well-matched with individual capabilities and cannot be fulfilled by a term position
- Efforts are related towards research; not long-term operations and/or project activities

## × What's not supported by research grants

- Any significant operations and/or project-related activities:
  - Engineering, major items of equipment, consumables for prototyping or production
- Non-HEP related efforts
  - Gravity (LIGO), Heavy Ion (RHIC), AMO Science, etc.

# What does HEP Theory cover?

- Topics studied in theoretical high energy physics research *include, but are not limited to*: **phenomenological and theoretical studies that support experimental HEP research at the three frontiers**, both in understanding the data and in finding new directions for experimental exploration; **development of analytical and numerical computational techniques for these studies**; and **construction and exploration of theoretical frameworks for understanding fundamental particles and forces** at the deepest level possible.
- The program is centered across several research areas:
  - 1) Standard Model Phenomenology, which involves high precision calculations of Standard Model predictions such as Monte Carlo simulation, higher order calculations of particle production rates and distributions, radiative corrections, and extraction of parton distribution functions;
  - 2) Beyond the Standard Model Phenomenology, which studies the experimental consequences of extensions of the Standard Model as well as the search for new particles given their signatures in collider and astrophysical sources, and in rare processes;
  - 3) Cosmology and Astroparticle theory, which studies the early universe, inflation scenarios, large scale structure formation, particle models for Dark Matter and prospects for its detection, Dark Energy and its theoretical consequences, quantum gravity and black holes;
  - 4) Lattice Field Theory, which involves the study and simulation of lattice models of quantum field theory and its phenomenology;
  - 5) formal and mathematical aspects of quantum field theory, including string theory.

# Subprogram Review Panels

- **The Comparative Review process is very competitive and hard choices have to be made based on the reviews, as well as to fit into our limited funding availability.**
  - The process by definition implies that certain proposals and investigators will be ranked at the top, middle, and bottom.
- **It is understood that the vast majority of people applying are working hard and their efforts are in support of the HEP program. Due to the rankings & comments by the reviewers and our constrained budgets, some people whose research activities and level of effort who are ranked lower in terms of priority and impact relative to others in the field will not be funded on the grant**
  - This does not necessarily mean the person cannot continue working on the experiments or theoretical research; they are not being funded by the grant to do it. It could be that the person has a critical role in the program but this did not come out in the proposal or review process. That is why it is imperative to respond to the FOA solicitation and detail each person's efforts.
- **The subprogram review panel sees all of the proposals and will make recommendations and rankings relative to each other. When the panel is faced with comparing efforts, impacts and a limited budget, rather than rank the whole proposal low, they may provide guidance regarding details of the proposals**

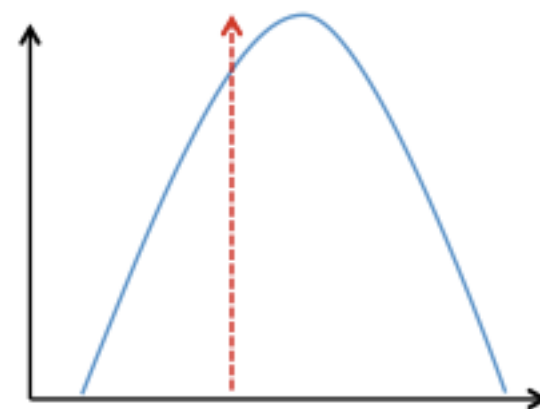
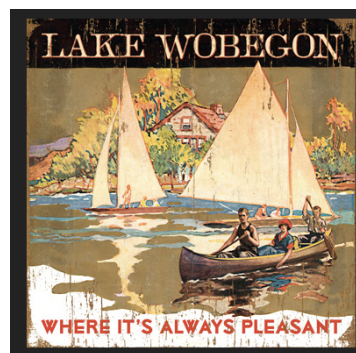
8/5/13 **e.g., person X should not be funded; do not add additional postdoc on this effort**

# Programmatic Considerations

- **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**
- **Many factors weigh into final funding decisions**
  - **Compelling research proposal for next ~3 years**
    - ✓ **Interesting? Novel? Significant? Plausibly achievable?**
    - ✗ **Incremental? Implausibly ambitious? Poorly presented?**
  - **Significant recent contributions in last 3-4 years**
    - **Contributions to operations and research infrastructure of experiments**
    - **Synergy and collaboration within group (as appropriate)**
    - **Alignment with programmatic priorities**
- **Supportive of excellent people, including excellent *new* people, even when times are tough!**

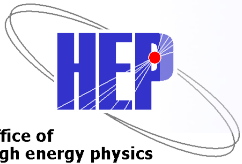
# Comparative Evaluation

- The program managers will need to determine:
  - The threshold for funding each proposal, and
  - The level of support for each funded proposal.
- Your scores and rankings on the proposals and senior investigators will provide essential input to DOE's process of optimizing resource allocations for the University research program.
  - Not everyone can be "Above Average."



# Comparative Review in a nutshell

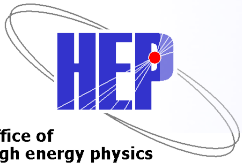
- 6 Panels
  - EF; IF; CF; Theory; Detector R&D; Accelerator
  - Not a FACA panel
    - Summary from Panel discussion redacted by Panel Chair
  - Mail-in reviews and panelists review
    - Standard review criteria from SC
  - Comparison of groups and PIs
    - Possible groups personnel reduction
  - Final ranking of groups/PI
    - Funding allocation based on available funding
    - Request generally much higher than available budget
      - HEP budget is NOT increasing!



# Comparative Review FY13 Statistics

- **FY 2013 cycle:**
  - 185 proposals requesting support totaling \$335.782M in one or more of the six sub-programs
  - received by the September 10, 2012 deadline in response to DE-FOA-0000733
  
- **After pre-screening all incoming proposals for responsiveness to the subprogram descriptions and for compliance with the proposal requirements: 12 were declined before the competition**
  - There were hard page limits and other requirements. Proposals not respecting the page limits or other requirements were NOT reviewed
    - 5 proposals declined without review for this reason
    - 1 proposal was missing a research narrative
    - 4 were outside the scope of HEP
    - 2 proposals were non-responsive
  - PIs with proposals that were rejected for “technical” reasons could re-submit to general DOE/SC solicitation
  
- **11 proposals were withdrawn by the respective sponsoring institutions**
  - 4 were duplicate submissions
  - 6 were supplemental requests submitted to the incorrect FOA
  - 1 proposal was submitted from a federal agency which was ineligible



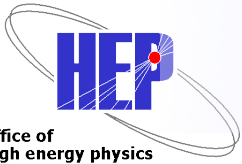


# FY13 Review and Panel

- For the FY13 HEP Comparative Review process, 162 submitted proposals reviewed, evaluated and discussed by several panels of experts who met in the 6 HEP subprograms:

Subprogram	Panel Deliberations	# of Total Proposals
Intensity Frontier	November 5-6, 2012	31
Theory	November 6-8, 2012	53
Particle Detector R&D	November 8-9, 2012	22
Energy Frontier	November 13-15, 2012	45
Accelerator Science and Technology R&D	November 13-14, 2012	40
Cosmic Frontier	November 14-16, 2012	28

- 30 of the proposals requested research support from 2 or more of the 6 subprograms, *e.g.*, umbrella proposals
  - In such cases, 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 3 experts
  - 130 reviewers participated in the review process (mostly reviewing several proposals)
  - 834 reviews were completed with an average 5.2 reviews per proposal



# FY13 Review Data By Proposal

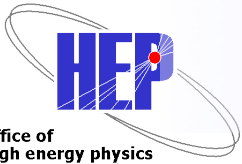
	Energy	Intensity	Cosmic	Theory	Acc. R&D	Det. R&D	HEP Total
<b>Received</b>	<b>46</b>	<b>33</b>	<b>33</b>	<b>56</b>	<b>44</b>	<b>30</b>	<b>185</b>
<b>Declined/Withdrawn Without Review</b>	<b>1</b>	<b>2</b>	<b>5</b>	<b>3</b>	<b>4</b>	<b>8</b>	<b>23</b>
<b>Reviewed</b>	<b>45 (1)</b>	<b>31 (5)</b>	<b>28 (14)</b>	<b>53 (11)</b>	<b>40 (21)</b>	<b>22 (14)</b>	<b>162 (58)</b>
<b>Funded</b>	<b>40<sup>(a)</sup> (0)</b>	<b>24 (3)</b>	<b>18 (4)</b>	<b>35 (4)</b>	<b>17<sup>(b)</sup> (3)</b>	<b>12 (6)</b>	<b>101 (20)</b>
<b>Declined</b>	<b>5 (1)</b>	<b>7 (2)</b>	<b>10 (10)</b>	<b>18 (7)</b>	<b>23 (17)</b>	<b>10 (8)</b>	<b>61 (38)</b>
<b>“Success Rate” (%) (Previous/New)</b>	<b>89</b>	<b>77</b>	<b>64</b>	<b>66</b>	<b>43</b>	<b>55</b>	<b>62 (78/34)</b>

## NOTES:

- Single proposals with multiple research thrusts are counted multiple times (1 /thrust)
- ( ) indicates number of proposals from research groups that did not receive DOE HEP funding in FY12.
- “Success Rate” is = # Funded/ # Reviewed.
- Most proposals are not fully funded at requested level.
- About 68% of the proposals reviewed were from research groups that received DOE HEP funding in FY12.
- Overall success rate of reviewed proposals for previously (newly) funded groups was 78% (34%).

<sup>(a)</sup> 3 of 40 Energy funded proposals were provided term support (<1 year) for graduate students and post-docs.

<sup>(b)</sup> 5 of 17 Accelerator R&D funded proposals were provided term support (<1 year).



# FY13 Review Data by PI

	Energy	Intensity	Cosmic	Theory	Acc. R&D	Det. R&D	HEP Total
<b>Received</b>	<b>127</b>	<b>56</b>	<b>61</b>	<b>155</b>	<b>57</b>	<b>47</b>	<b>504</b>
<b>Declined/Withdrawn Without Review</b>	<b>1</b>	<b>2</b>	<b>8</b>	<b>9</b>	<b>4</b>	<b>18</b>	<b>42</b>
<b>Reviewed</b>	<b>126 (7)</b>	<b>54 (8)</b>	<b>54 (30)</b>	<b>146 (24)</b>	<b>53 (25)</b>	<b>29 (19)</b>	<b>462 (113)</b>
<b>Funded</b>	<b>112 (3)</b>	<b>43 (6)</b>	<b>27 (7)</b>	<b>115 (11)</b>	<b>24 (4)</b>	<b>19 (9)</b>	<b>338 (40)</b>
<b>Declined</b>	<b>14 (4)</b>	<b>11 (2)</b>	<b>26 (23)</b>	<b>31 (13)</b>	<b>29 (21)</b>	<b>13 (10)</b>	<b>124 (73)</b>
<b>“Success Rate” (%) (Previous/New)</b>	<b>89</b>	<b>80</b>	<b>51</b>	<b>79</b>	<b>45</b>	<b>53</b>	<b>73 (85/35)</b>

**NOTES:**

- ( ) indicates number of senior investigators that did not receive DOE HEP funding in FY12.
- “Success Rate” is = # Funded/ # Reviewed.
- Overall success rate for previously (newly) funded DOE HEP PIs was 85% (35%).
- Most (but not all) PIs who are funded, are funded at requested effort level.

# FY13 Review Data

	Total # Jr. Faculty Reviewed (New)	# Jr. Faculty Funded (New)	Total # Res. Scientists Reviewed (New)	# Res. Scientists Funded (New)
Accelerator R&D	7 (7)	1 (1)	34 (11)	20 (0)
Cosmic Frontier	10 (8)	3 (3)	2 (2)	0 (0)
Detector R&D	3 (2)	1 (1)	10 (5)	6 (2)
Energy Frontier	16 (3)	15 (2)	28 (2)	18 (1) *
Intensity Frontier	9 (5)	7 (5)	5 (0)	4 (0)
Theory	15 (7)	13 (6)	3 (0)	0 (0)
<b>HEP Total</b>	<b>60 (32)</b>	<b>40 (18)</b>	<b>81 (20)</b>	<b>47 (3)</b>

\* DOE worked with US CMS and US ATLAS management to find support for fraction of needed Research Scientists through the LHC Ops program

# Food for thought

- Role of theory in DOE-supported research
  - HEP mission at the frontiers
    - **Intensity Frontier** leadership → is the theory effort adequate?
    - **Energy Frontier** co-leadership → is the US effort comparable and competitive with the European one?
    - **Cosmic Frontier** co-leadership → DM and DE, relationship with astrophysics, active role of theorists in experimental collaborations
  - Relationship with other sectors/agencies and fitting it within our budget envelope
    - **Nuclear Physics** → neutrino physics at low/medium energy; Heavy Ions Physics (holography applications); IF synergies
    - **BES and Condensed Matter** → the re-branding of String Theory?
    - **Computational aspects of HEP theory** → Cosmology initiatives; Lattice (HEP vs NP); Monte Carlo simulation

# Food for thought (II)

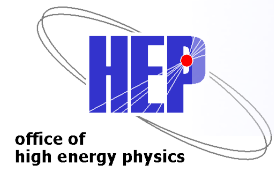
- The US budget climate for research is precarious
- The US does not rank as appealing as it used to be only 10-15 years ago
  - How many offers from Zurich??
  - How many Montecarlos from European groups ?
  - 70% of top hep-lat papers have European authors
- As a community we need to concentrate on **strength and competitiveness of our field in an international setting**
  - This might mean consolidating funding at centers of excellence and fund the best groups in the best places
  - Labs and University “faculty” fulfill different roles and places where research is allowed 100% of time should be preserved.
  - We can’t fund everything and everybody
  - We need to consider the job perspective of students and postdocs and train them accordingly
    - How many more Quants ?

# Your Food for thought

“theory community” is **diverse**, so getting a consensus view on **all (any?)** points is challenging, but **theory panel report may want to discuss some so that we define the answers, not others**

- Do we have enough/too few/too many theorists? What would more theorists or more funding accomplish that isn't accomplished now?
  - Should certain areas be specifically targeted for increased funding?
  - If funding is tight, is it better to fund a smaller number of theorists well, rather than funding “everyone” by only a little?
- **Resources are fixed**
- **Don't waste effort criticizing funding agencies for this**
  - **Only Congress (or a big donor) can make the pot bigger**
- **Before asking for a larger slice of pie, be ready to argue why someone else should get smaller slice**

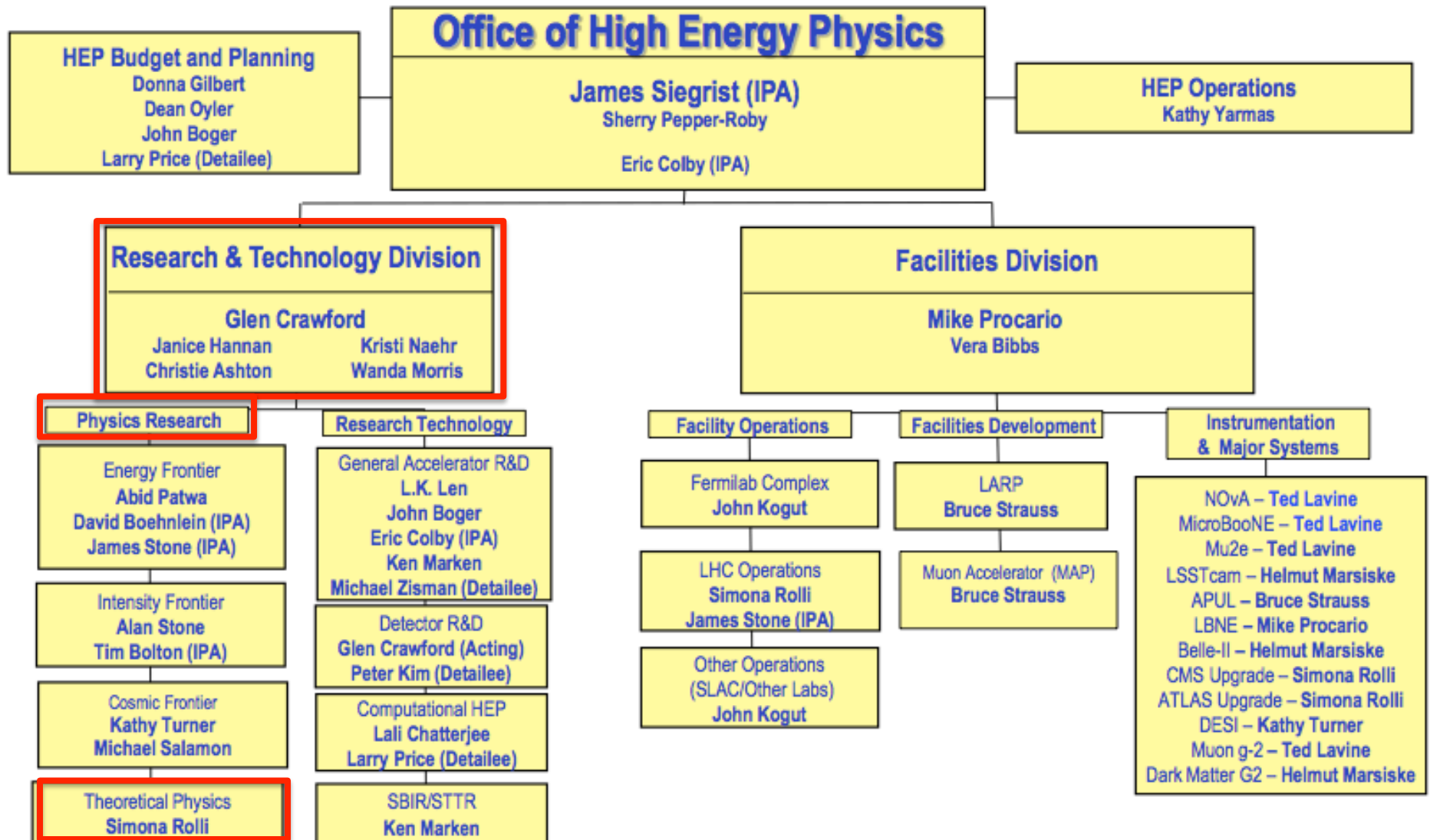
**Need to have a frank discussion of**



# Backup

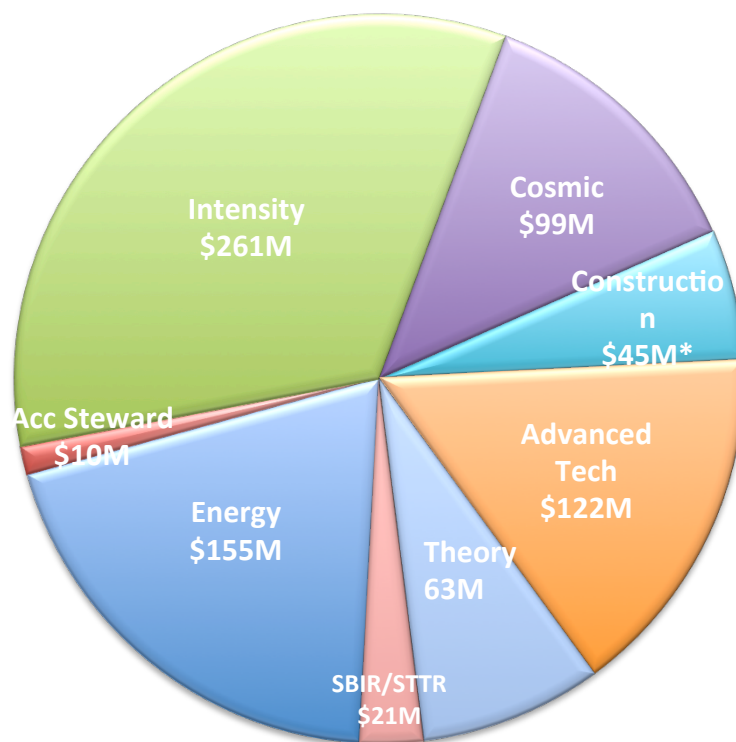


# HEP Organization Chart



# Budget breakdown

## By "Frontier"



\* Includes Other Project Costs (R&D) for LBNE