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# STRATEGIC PLANNING AND COMMUNITY PROCESS

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# Major Recommendations of 2008 Advisory Panel (P5)

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- The panel recommends that the US maintain a leadership role in world-wide particle physics. The panel recommends a strong, integrated research program at the three frontiers of the field: **the Energy Frontier, the Intensity Frontier and the Cosmic Frontier.**
- The panel recommends support for the US LHC program, including US involvement in the planned detector and accelerator upgrades. (**highest priority**)
- The panel recommends a world-class neutrino program as a core component of the US program, with the long-term vision of a **large detector in the proposed DUSEL and a high-intensity neutrino source at Fermilab.**
- The panel recommends funding for **measurements of rare processes** to an extent depending on the funding levels available... (Mu2e)
- The panel recommends support for the study of **dark matter and dark energy** as an integral part of the US particle physics program.
- The panel recommends a **broad strategic program in accelerator R&D**, including work ..., along with support of **basic accelerator science.**
- **These are still relevant, and this is still the plan.**

# Strategic Planning

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- **The HEP budget 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.
- **Need to start planning now for what comes next.**
  - Engaging with DPF community planning process that will conclude this summer.
  - Will set up a prioritization process (a la P5) using that input.



# Customized Implementation Strategies

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- **Energy Frontier**
  - US has a leading role in LHC physics collaborations but is not the driver
    - The issue is the scope and scale of US involvement. Requires US-CERN negotiation.
    - Could also be true for Japanese-hosted ILC
- **Intensity Frontier**
  - US is the world leader and needs new facilities and/or upgrades of existing facilities to maintain its position
    - Has the potential to attract new partners to US-led projects
    - Portfolio of experiments and science case is diverse. This complicates the case. The scale of the projected investments is a big challenge
- **Cosmic Frontier**
  - US HEP has a leading role in a competitive, multidisciplinary environment
    - HEP component of the physics case is simple and compelling. Only question is how far one needs to go in precision/setting limits on, e.g., dark matter.
    - DOE is a technology enabler, not a facilities provider (see NSF, NASA)
      - Analogous to LHC but the HEP physics goals are not those of the facility owners
    - DOE supports particle physics goals and HEP-style collaborations
      - Astronomy and astrophysics is not in our mission nor our *modus operandi*



# Joint Agency Letter to the Community

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- Fundamentally...[planning] is a multi-step process with several important milestones over the coming year, and each step will inform and prepare for the next.
  1. **HEP Facilities Subpanel**: Advise DOE/SC mgmt. on the scientific impact and technical maturity of planned and proposed SC Facilities, in order to develop a coherent 10-yr SC facilities plan
    - Subpanel can add or subtract from initial facilities list
    - Does not exclude/pre-empt later additions
  2. **DPF/CSS2013 “Snowmass”**: community identifies compelling HEP science opportunities over an approximately 20 year time frame.
    - Not a prioritization but can make scientific judgments
  3. **HEPAP/P5**: Advises agencies on new strategic plan and priorities for US HEP in various funding scenarios, using input from #1 and 2 above (among others)

# Snowmass / P5 Interface

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## What we hope to see from Snowmass:

- What are the most compelling science questions in HEP that can be addressed in the next 10 to 20 years and why
- What are the primary experimental approaches that can be used to address them? Are they likely to answer the question(s) in a “definitive” manner or will follow-on experiments be needed?
- What are the “hard questions” (science, technical, cost...) that a given experiment or facility needs to answer to respond to perceived limitations in its proposal?

**These topics should be covered in the Snowmass reports and white papers. P5 will use these reports and white papers as its starting point.**

- We expect to have the P5 panel selected and a formal charge issued by the time of the September HEPAP meeting

# Goals for the P5 Process

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DOE/NSF met in early May to kickoff P5 process and agree on goals:

- The P5 process takes the science vision of the community and turns it into plan that is feasible and executable over a 10-20 year timescale
- HEP **MUST** have a planning and prioritization process that the community can stand behind and support once the P5 report is complete.
- We also need a process that repeats at more less regular intervals (5 years?)
  - We also want to allow for less comprehensive updates and modest course corrections to the plan along the way (a la P5 updates in 2009, 2010)
- **Key elements envisioned for the P5 process:**
  - Revisit the questions we use to describe the field (eg. *Quantum Universe*, updated and corrected)
  - Decide on the project priorities within budget guidance (in detail for the next 10 years, in broad outline beyond that)
  - Propose the best way to describe the *value* of HEP research to society
  - Build on the investment in Snowmass process and outcomes



# What P5 Is (and is Not)

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**P5 will prioritize HEP projects over a 10-20 year timeframe within reasonable budget assumptions and position the U.S. to be a leader in some (but not all) areas of HEP.**

- This will include an explicit discussion of the necessity (or not) of domestic HEP facilities in order to maintain such a world leadership position.
- Necessarily this will involve consideration of technical feasibility as well as plausible timescales and resources for future projects.
- There will be budget “fixed points” for projects already under construction and other prior commitments

**The charge to P5 will NOT include explicit examination of**

- Agency review processes
- Roles, responsibilities and funding of labs versus universities
- Relative funding of experimental HEP vs theory vs technology R&D





# DRAFT New P5 Process (for discussion)

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Based on adopting “best practices” from our colleagues in Nuclear Physics and Astrophysics, we are considering the following enhancements to the P5 process for this iteration:

- Greatly enlarged P5 panel (~50 members). Previous P5 had 21 members
  - Nominations will be sought from HEP and related communities through a ‘Dear Colleague’ letter
  - Snowmass output (reports, white papers) as a starting point, but may solicit additional material on specific projects
- Several “town meetings” as public forums not only to advocate for particular science opportunities but also to *prioritize*
  - Each sub-group of the community should be able to prioritize the most important science (and projects) within its specialty. P5 will recommend priorities across the entire field.
- Working subgroup for updating the *Quantum Universe* questions in parallel with science priority discussion
- Separate working group elucidating HEP benefits to society



# DRAFT New P5 Timeline

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**May:** DOE/NSF agree on outlines of P5 process and inform community via presentations and “dear colleague” letter

**June:** Call for nominations to P5

**July:** Agencies draft P5 charge. HEPAP Chair reviews P5 nominations and begins selection process

**August :** Snowmass meeting concludes, reports issued. P5 charge sent to HEPAP Chair.

**Sept :** HEPAP Meeting. P5 charge and membership formally announced. Timeline for P5 meetings announced.

**Fall 2013 :** Town Meetings (4 or 5, venues and topics TBD)

**Winter/Spring 2014 :** P5 meetings (phone in and face to face)

**Spring/Summer 2014 :** P5 report(s) due. Exact dates and deliverables to be spelled out in P5 charge.



# Draft Proposed Town Meetings(1)

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- **First meeting on the overall strategy, questions to describe the field, and discussion of how technology development priorities and other crosscutting issues should be covered in the P5 report**
  - Start with the current P5 plan and possible alternatives as well as global strategy considerations.
    - Need to understand “where we are now” and recognize much has changed since the last P5 – does this also change our strategy? Does this change how we think about the field?
    - Open discussion of issues so the community can better understand the constraints, and hopefully reach broader agreement.
  - Fundamental questions for the field and how to unify/connect the Frontiers framework will also be discussed
    - Input from the Theory community will be especially important in this area
  - Technology support will NOT be a main focus of P5, but the panel will benefit from wisdom in the community in this area.
    - E.g., Do we have a coherent technology R&D plan that dovetails with the science opportunities? If not, how do we get there?
    - Note that ‘Accelerator Stewardship’ is an Office of Science wide initiative managed by the HEP office, so should be discussed for information, but will not be modified by P5.



# Draft Proposed Town Hall Meetings(2)

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- **Subsequent meetings will focus on open community discussion of project priorities on each of the frontiers: Intensity, Energy, and Cosmic.**
  - The expected outcome will be advice to P5 on a *prioritized project list* by frontier. Each meeting will focus on one frontier, not flaws in the plan of the other frontiers.
  - The process will be moderated by P5 itself, and based on input from Snowmass whitepapers and project whitepapers updated from the facility panel, Snowmass, or just for this purpose.
  - P5 will see to it that the meetings to not descend into a shouting contest
  - The budget guidance to P5 will be public as part of its Charge, so proponents will have a good idea of the total budget envelope that can be considered and can debate what is a “reasonable” budget profile.
- **Based on the results of the first 4 meetings, we will consider a 5<sup>th</sup> meeting to ‘wrap up’ and discuss any broad matters arising.**

# Next Steps

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- The agencies welcome input from the community on the shape of the P5 process.
- Expect to see a ‘Dear Colleague’ letter soon reiterating the ideas contained in this presentation.
  - To be followed by request for nominations to P5
- We have until the end of Snowmass to modify our P5 plans, and the agencies plan a series of talks at the Snowmass meetings to solicit further input.
- The agencies expect that our community is capable of adult behavior, and look forward to vigorous and open discussions of our challenges and opportunities.



**BACKUP**

# HEP Budget Overview

- **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 → ~~Projects~~ → Research
  - Therefore the FY14 Request shows *increases* for Research which are driven by this R&D “bump”, while Construction/MIE funding is only slightly increased
- **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

# FY 2014 High Energy Physics Budget

(Data in new structure, dollars in thousands)

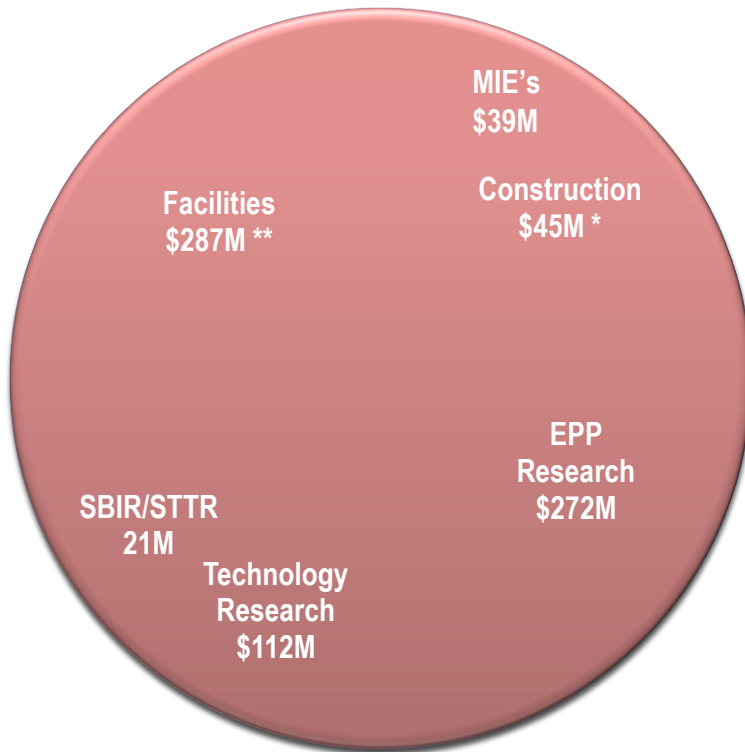
Description	FY 2012 Actual	FY 2014 Request	Explanation of Change
Energy Frontier Exp. Physics	159,997	154,687	Ramp-down of Tevatron
Intensity Frontier Exp. Physics	283,675	271,043	Completion of NOvA (MIE), partially offset by Fermi Ops
Cosmic Frontier Exp. Physics	71,940	99,080	Ramp-up of LSST
Theoretical and Computational Physics	66,965	62,870	Continuing reductions in Research
Advanced Technology R&D	157,106	122,453	Completion of ILC R&D
Accelerator Stewardship	2,850	9,931	FY14 includes Stewardship-related Research
SBIR/STTR	0	21,457	
Construction (Line Item)	28,000	35,000	Mostly Mu2e; no LBNE ramp-up
<b>Total, High Energy Physics</b>	<b>770,533*</b>	<b>776,521</b>	<b>Down -1.8% after SBIR correction</b>
<b>Office of Science</b>	<b>4,873,634</b>	<b>5,152,752</b>	

\*The FY 2012 Actual is reduced by \$20,327,000 for SBIR/STTR



# FY 2014 Request Crosscuts

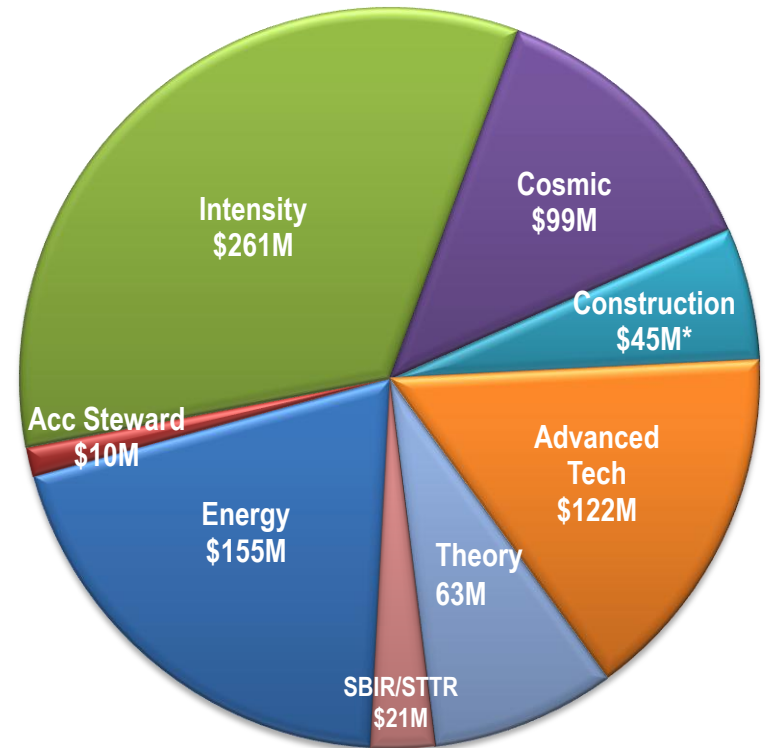
## By Function



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

\*\*Includes \$15.9M Other Facility Support

## By Frontier



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

# Current LBNE Strategy

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- **We are trying to follow the reconfiguration (phased) plan for LBNE, though it has hit some snags**
  - **Out year budgets are challenging**
  - **Some members of the community objected that the phased LBNE was not what P5 (or they) had in mind**
- **The plan, as it currently stands:**
  - **Use time before baselining to recruit partners (international and domestic) that expand scope and science reach**
  - **Working to get more of the community on board**
- **It seems clear this is necessary. Will it also be sufficient?**
  - **Need to get agreement on what is required for success**

# MIE Issues

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- **We were not able to implement (most) new MIE starts in FY14 request**
  - **Muon g-2 experiment is the only new start in HEP**
- **This upsets at least 2 major features of our budget strategy:**
  - **Strategic plan : “Trading Research for Projects”**
  - **Implementation of facilities balanced across Frontiers**