

# **Report on HEPAP activities**

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# What is HEPAP?

## High Energy Physics Advisory Panel

- **Advises the DOE & NSF on the particle physics program.**
- **Federal Advisory Committee Act rules**
  - **Public meetings**
  - **US members are Special Government Employees on meeting days.**
    - **Subject to federal conflict-of-interest rules**
    - **“Special” ⇒ paycheck = \$0.00**
  - **Appointed by DOE Under-Secretary for Science & NSF Director**
  - **Reports to Assoc. Dir. for OHEP & Asst. Dir. Math & Phys. Sciences**
  - **Broad membership: subfield, univ & labs, demographics (geography,...)**
    - **Members don't serve as representatives of constituencies; advise on the health of the entire field.**
    - **Foreign members provide information on programs in Europe & Asia**

# Current Membership

- **Hiroaki Aihara, Tokyo**
- **Marina Artuso, Syracuse**
- **Alice Bean, Kansas**
- **Patricia Burchat, Stanford**
- **Priscilla Cushman, Minn.**
- **Lance Dixon, SLAC**
- **Sarah Eno, Maryland**
- **Graciela Gelmini, UCLA**
- **Larry Gladney, Penn**
- **Boris Kayser, FNAL (DPF)**
- **Robert Kephart, FNAL**
- **Steve Kettell, BNL**
- **Wim Leemans, LBNL**
- **Daniel Marlow, Princeton**
- **Ann Nelson, Washington**
- **Stephen Olsen, Hawaii**
- **Lisa Randall, Harvard**
- **Kate Scholberg, Duke**
- **Sally Seidel, New Mexico**
- **Melvyn Shochet, Chicago**
- **Henry Sobel, Irvine**
- **Paris Sphicas, CERN**
- **Maury Tigner, Cornell**
- **William Trischuk, Toronto**
- **Herman White, FNAL**

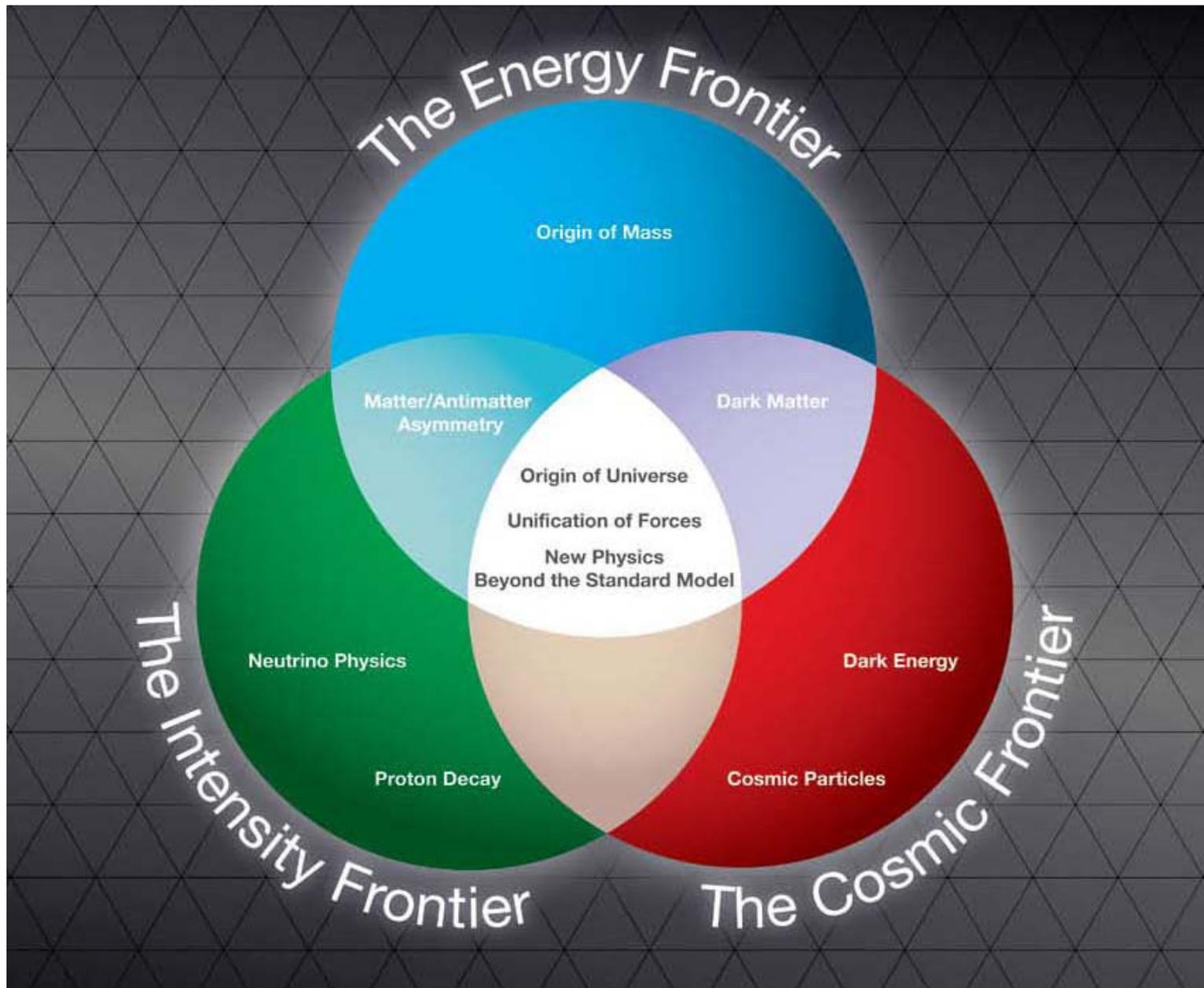
# Meetings

- **3 meetings per year**
- **Agenda**
  - reports from the funding agencies on budgets & their impact, recent events, successes and problems
  - reports from specialized subpanels that need HEPAP approval to become official government documents (ex. P5)
  - reports from other committees that impact HEP (ex. EPP2010)
  - informational reports on issues that might arise in the future (ex. advanced accelerator R&D)
- **Letter from Chair summarizes the meeting, including HEPAP views.**

**<http://www.science.doe.gov/hep/panels/hepap.shtml>**

## Highlights from the past year

- **P5 report - almost exactly 1 year ago.**
- **Charged with developing prioritized programs under different funding scenarios.**
- **Scientific priorities unchanged, but altered context**
  - completion of program at US collider facilities
    - **CESR, PEP-II, Tevatron in a few years**
  - delay in possible ILC construction schedule
  - very serious fiscal challenges
- **Many compelling scientific questions: how best to present them**
  - Since long-range plans focus on large projects, P5 organized the report by the tools used to carry out the investigations.



# Energy Frontier

- **Full exploitation of LHC including upgrades**
- **R&D for a future lepton collider (ILC and beyond)**
- **Tevatron operation beyond the current run in the better funding scenarios**
  - **Opportunity costs at FNAL: current vs. future program**
  - **Imminent turn-on of the LHC**
- **Detector R&D for future large detectors**

# Intensity Frontier

- **Broad program based around a new linear proton accelerator producing a high intensity  $\nu$  beam aimed at a large detector in DUSEL.**
  - **CP violation in the lepton sector (+ proton decay + supernova  $\nu$ 's)**
  - **Dark matter & neutrinoless double-beta decay expt's in DUSEL**
  - **Rare processes:  $\mu$  conversion, K decay**
- **If budget permits, participation in one super-B factory overseas**

# Cosmic Frontier

- **Particle physics/astrophysics boundary increasingly blurred**
  - Focus here on addressing key particle physics questions
- **Dark energy**
  - Ground-based & space-based
  - Near-term & long-term
- **Dark matter**
  - Direct observation of cosmic dark matter interacting in underground detectors
- **R&D funding for future particle astrophysics experiments**

- **Advanced accelerator & detector R&D**
  - Important to particle physics and the broader scientific enterprise
- **Strengthening university groups – experiment and theory**
- **Significantly reduced productivity/leadership under the lowest funding scenario.**
- **Large increase in scientific output under the doubling scenario.**

# Other issues during the past year - Autumn

- **Great concern if continuing resolution continued.**
  - Fortunately an FY09 budget was passed (+ **stimulus package**)
- **Status reports:**
  - **NOvA** – impact of continuing resolution & possibility of later recouping lost construction time
  - **Proton Source** – Fermilab's plans
  - **ILC** – response to the severe budget decrease in the US & UK
  - **LHC** – Lyn Evans on the turn-on, the failure, & the repair plan
  - **JDEM** – interagency planning; Science Working Group

# Winter

- **New administration's priorities**
- **Agency planning for ARRA funds**
- **European planning in particle astrophysics**
- **R&D toward a large liquid-argon detector**
- **Internal HEPAP working groups**
  - **Recruiting applicants for agency positions**
  - **Particle physics demography survey**
  - **Health of the university program**

# Meeting a few weeks ago

- **Much more upbeat agency budget report!**
  - **FY09, ARRA, FY10**
  - **Optimistic but cautious:** great improvement, but increase smaller than for most other Office of Science programs & the large deficits will have to be dealt with in the future.
  - **Design issues with the proposed super-B factories.**
  - **Advanced accelerator R&D: large increase in accelerating gradient using plasma or laser wake fields**
  - **Astronomy & Astrophysics Decadal Survey**
  - **INSPIRE: new HEP information system replacing SPIRES – much more powerful**

# Particle Astrophysics Scientific Assessment Group

- **Within the context of the P5 report, develop the plan for the cosmic frontier in more detail.**
- **Chair – Steve Ritz**
- **Broad committee**
- **Various budget scenarios**
- **“limited to opportunities that will advance our understanding of the fundamental properties of particles and forces using observations of phenomena from astrophysical sources”**
- **Dark matter, dark energy, high-energy cosmic rays,  $\gamma$  rays,  $\nu$ 's, CMB**
- **Make use of previous reports like DMSAG**
- **Just starting – in the data collection phase**