

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” \Rightarrow 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**

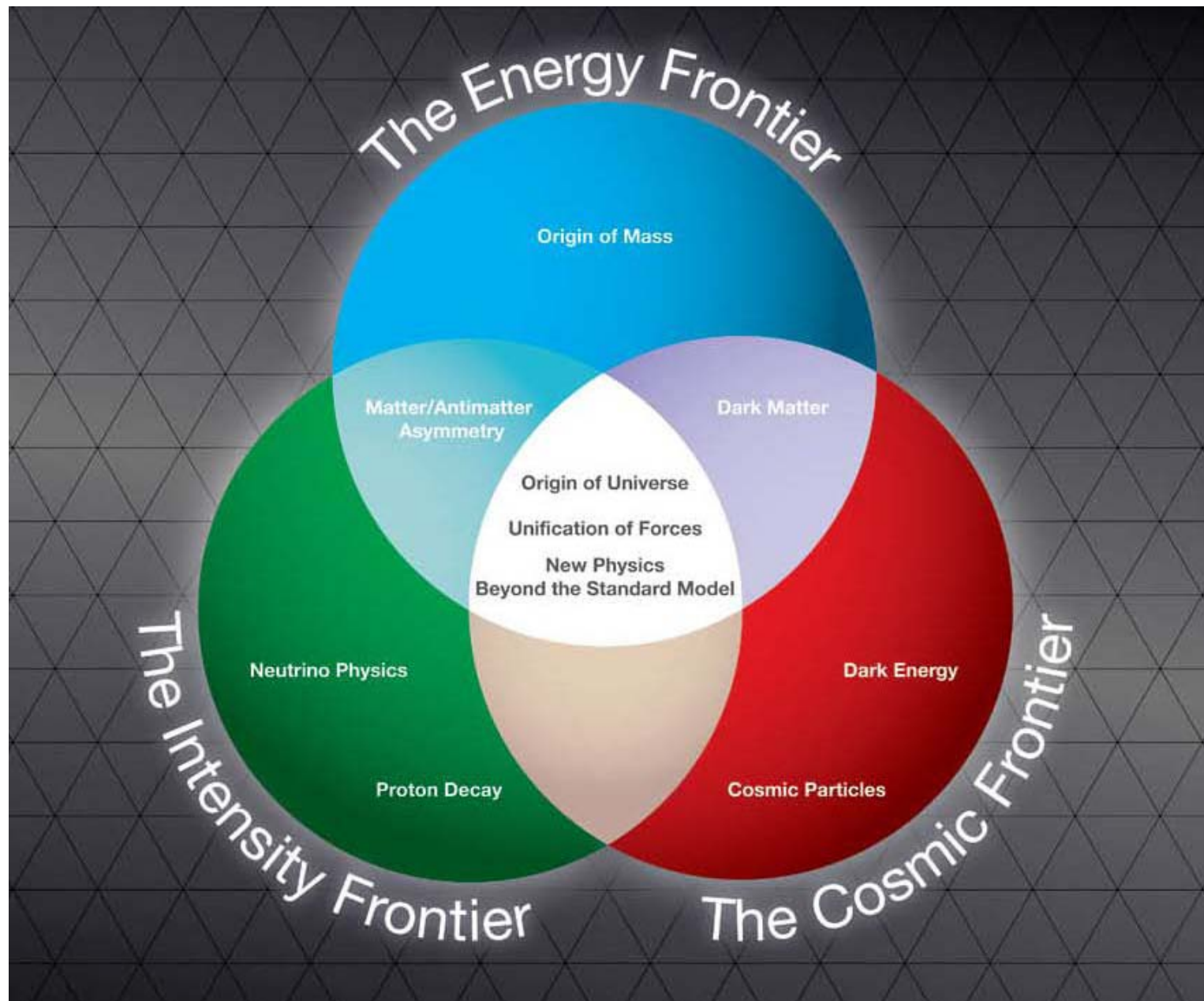
Meetings

- **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 ν beam aimed at a large detector in DUSEL.
 - CP violation in the lepton sector (+ proton decay + supernova ν 's)
 - Dark matter & neutrinoless double-beta decay expt's in DUSEL
 - Rare processes: μ 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, γ rays, ν 's, CMB
- Make use of previous reports like DMSAG
- Just starting – in the data collection phase