Report of the University Subcommittee

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Our "Charge"

- We are not a HEPAP Subpanel, so there is no charge from the agencies.
- The HEPAP chair did, however, ask us to meet informally to identify problems of concern to the university community.
- In 2009, we conducted a survey, the results of which were reported at the October HEPAP meeting
- Last year we decided not to do another survey, but rather to simply solicit written (e-mail) comments from the community.
- This year we decided to focus on two issues that had been raised in previous surveys. We did not attempt any sort of formal survey, but we did consult with colleagues. The topics are:
  - University Technical Infrastructure
  - Funding paths for new faculty

University Technical Infrastructure

- University groups produce two "products"
  - Papers (a.k.a. science)
  - Detector and electronics for the experiments we do
  - People (highly qualified personnel—HQP's)
- The first two of these products is clearly of utmost importance
- The training of personnel is also extremely important, however, since it impacts:
  - The future of the HEP
  - One of our societal contributions
- While we continue to attract and train students who are both extremely bright and highly motivated, the average level of technical proficiency* they attain is lower.
  - The opportunities to participate in H/W development are fewer
  - Those opportunities that do exist are generally of smaller scope

*we do not include S/W proficiency, which is increasingly important.

Benefits of Technical Infrastructure

- In general, this refers to both equipment and people
  - Both are important
  - The two go hand in hand
  - In general, it is the people that drive the cost
- Technical staff and senior researchers serve a vital function
  - Bring technical expertise that faculty may lack
  - Offload tasks that faculty are too busy to handle
  - Work with students and post docs in a highly synergistic way--youthful enthusiasm combined with seasoned professionalism can be a highly potent combination
  - Provide a "corporate memory" of tools and techniques from previous experiments

Factors Contributing to the Demise of Technical Infrastructure

- High cost and long time scale of the experiments
  - CDF started in early 1980;'s yet students are still extracting physics results
  - The major LHC experiments cost in the hundreds of millions
- The "physics factory" mode of operation has tended to raise the fortunes of "analysts" relative to those specializing in the hardware and operations.
- There has been a general downward pressure on funding
  - PIs have been obliged to reduce technical staff to make ends meet
  - Even when not forced to downsize, it is much simpler to take on post docs and students rather than technical staff, since with students and post docs reductions in force can be accomplished with relative ease through attrition

. . . Contributing Factors to the Demise

- The emphasis on accounting
  - Project management systems that are designed to monitor and control costs in ways that don't always mesh with university modes of operation.
  - Funding for university groups is increasingly divided into smaller categories, in many cases accompanied by "fire walls."
  - Both of these measures are well intended, but represent paving stones on the proverbial road.
    - The most serious effect is the loss of flexibility for PIs, who ultimately conclude that trying to maintain technical staff is more trouble than it is worth.
    - One must be careful not to sacrifice a substantive good purely for the sake of accounting.

No time to wobble

- Some have argued that the decline we have witnessed is destined to continue
- While it is true that some of the factors just outlined are unlikely to change, extreme pessimism is not warranted
  - Relatively small incremental commitments of resources would have a very positive effect (see e.g., the Homer Neal report)
  - Some of the changes are "revenue-neutral" organizational changes
  - Some changes may actually *lower* costs overall

Positive Aspects to be Retained

- The availability of funding for detector R&D both from the ADR program and in the base budget is obviously a good thing in this context
  - A modest expansion, particularly in areas that are truly generic would be most welcome.
- Project funding is extremely important
  - In many cases, it is the most important element in maintaining what infrastructure remains
  - University groups can often handle tasks in a much more cost effective way than labs
    - Lots of low-cost intellectual capital
    - Universities have low overhead rates
    - Universities often subsidize facilities and services

Concrete suggestions for further steps

- Avoid adding new barriers and reduce existing barriers between various funding sources
  - We were able to operate in the past without being so fastidious about the separation between base-grant and project funds.
  - Our colleagues in Europe continue in this mode, to no apparent ill effect.
  - Creating firewalls between the various funding categories may improve cost accounting, but it produces no real economies. Indeed, if anything, it does the opposite by constraining PIs in ways that lead to inefficiencies.
- Work with the community—e.g., the DPF—to raise the profile of instrument builders (see DPF task force report)