

Challenges For Realizing the ILC

The View from HEPAP

Fred Gilman

Snowmass 2005

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Prologue

Particle Physics Has Changed

- Particle physics is in revolutionary times. Along with the exhilarating achievement of a deep and beautiful understanding of the matter around us, we have the humbling appreciation that 95% of the universe is made of something else whose secrets could be as surprising and fascinating as all that has come before.
- The changing science of particle physics has been realized in what particle physicists are doing and preparing to do; it is reflected as well in the plans for the field of the subpanels of HEPAP and the recent expositions *Quantum Universe* and *Discovering the Quantum Universe: The Role of Colliders*.

Prologue

HEPAP Has Changed

- An evolving field and agencies ready to ask for HEPAP's help have made for subpanels simultaneously working at multiple levels: specific experiments (RSVP); sub-areas (TFCR, DETF, NuSAG, AAR&D); setting priorities across the whole field (P5); bringing the science of particle physics to broader audiences (Quantum Universe, LHC-ILC).
- The advice often involves multiple agencies (DOE, NSF, NASA) and multiple advisory committees (HEPAP, NSAC, AAAC).

Progress

US/HEPAP-centric Milestones

- Gilman Subpanel 1998
- Snowmass 2001
- Bagger-Barish Subpanel Report 2002
- USLCSG 2002
- DOE HEP Facilities Recommendations 2003
- DOE Office of Science Twenty-Year Facilities Plan 2003
- Involvement in the Global Science Forum Consultative Group on High-Energy Physics 2002-2004

Progress

Informing EPP2010

- The US National Academies have convened EPP2010, a broad-based committee on particle physics, that will make a prioritized fifteen-year plan. EPP2010 asked HEPAP specific questions on the physics case, the R&D plan, and the international-project aspects of the linear collider.
- The latter questions were answered by reports from the USLCSG and Barry Barish for the GDE.
- The questions on the physics case were answered
 - by a special report from a HEPAP subpanel, *Discovering the Quantum Universe: The Role of Colliders*, plus
 - a cover letter answering specific questions with pointers to *Discovering the Quantum Universe*.

Prospects

Some Personal Opinions

- Without being host to the ILC, in the next decade the US will no longer be among the world leaders in particle physics. US particle physics, much of it carried out off-shore and with stiff competition from other science opportunities, will be supported accordingly.
- We need an affirmation from EPP2010 and from the Secretary of Energy that the US is to be among the world leaders and will prepare a bid-to-host the ILC.

Prospects

Some Personal Opinions (2)

- But the real job falls on us. We must dramatically reprogram the field, assuming the current level of funding, in the next few years in order to free up new resources to ramp up the ILC effort and make the US a credible host.
- Among other things, that means decisions to give up on some near-term science in favor of going for the ILC; that would be tough even if we knew the ILC was sure to be built.
- The ILC is not for sure. The course is risky, but the alternatives are worse.