

The View from the Larger US Scientific Community

**Challenges for Realizing the ILC:
Funding, Regionalism and International Collaboration**

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US National Science Foundation

- Largest supporter of basic research – \$5.6B
- Funds *all* disciplines in *highly* competitive environment (success rate ~20%)
 - EPP competes against nanoscience, biophysics, cold atoms, astrophysics and math and chemistry just in MPS
- Tightly coupled to university research community
 - from proposals and peer review to National Science Board
- Viewed favorably around Washington
- “Facility Lite”
 - More than 80% of budget goes to university researchers
 - Facility construction ~\$200M/yr, largest facility ~\$400M
 - LHC: \$81M (NSF), \$450M (DOE)

Two Very Good Years

Dim prospects for a Linear Collider two years ago

- “Something big” about to happen in EPP articulated (*Quantum Universe*)
- Bold leadership at DOE (e.g., Ray Orbach and Robin Staffin)
- Formation of FALC (clarification of the relationship between ILC and CLIC)
- Selection of a single technology (“forward looking, synergies”)
- EPP2010 engaged larger scientific community (and society) in the priorities of EPP and discussion of ILC
- EPP outreach (e.g., *Symmetry*, www.interactions.org)
- Launch of GDE under leadership of Barry Barish
- Very successful end to Fermilab Director search
- Funding increment for LC R&D (FY06)
- Resolution of ITER site
- Beginning to understand/articulate the relationship between LHC and
- Lively ILC Workshops

EPP 2010

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Edward Witten, Institute for Advanced Study



**The International Linear
Collider now has
*Forward Momentum***

Challenges

- **Stick with a plan that is working**
 - Science First! (transition to a field defined by its science, not its tools)
 - Focus on readying the technology
 - Ensure success of LHC – the discoveries at LHC are essential to the launch of ILC
 - Diversified portfolio in EPP – neutrinos, particle astrophysics and cosmology – that matches the science opportunities laid out in *Quantum Universe*
- **Obtain a firm upper limit cost estimate with technology pathways to lower cost** (Genome project vs. SSC)
- **Saying with conviction that “big discoveries at LHC” are essential to moving forward with the ILC**
- **Developing a model for the ILC management**
 - ALMA (3 strong partners, weak central management)
 - Local host, global participation (ITER)
 - Gemini (multiple partners, strong central managing organization)
- **Identify the correct role for NSF**
 - NSF brings much more than money, university researchers, “science value calibration”



... not without setbacks, challenges

- Cancellation of BTeV, RSVP
- Beginning of transition to one primary US HEP lab
- Budgets constrained by deficits and other priorities
- Stunning scientific opportunities in other fields



Exciting Times

... but a time of transition

From a field defined more by its tools:

“High-Energy Physics”

To a field defined by its rich, broad and
exciting scientific questions:

“Elementary Particle Physics”

The Context

Elementary Particle Physics is Blessed
with the Greatest Intellectual
Opportunities Since the 1950s

But Faced with the Greatest Structural
Challenges Too

NB: A good strategy may be able to solve the latter; even money can't buy the former!

