



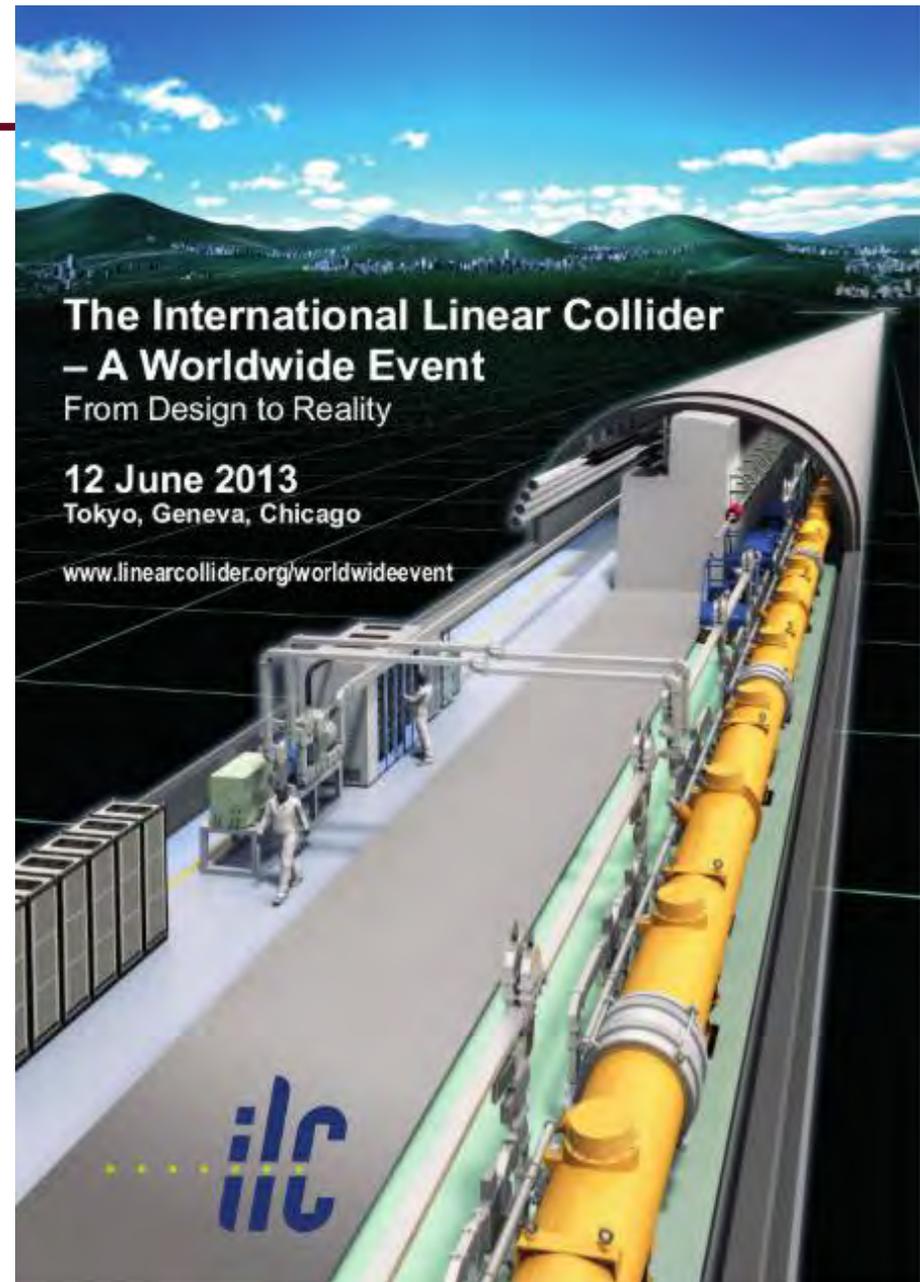
ILCSC Perspective

Jonathan Bagger
European Linear Collider ECFA Workshop
Hamburg, May 27, 2013



June 12, 2013

- Worldwide Event
 - Celebrating the official completion of the TDR!
 - Tokyo, Geneva, Chicago ...



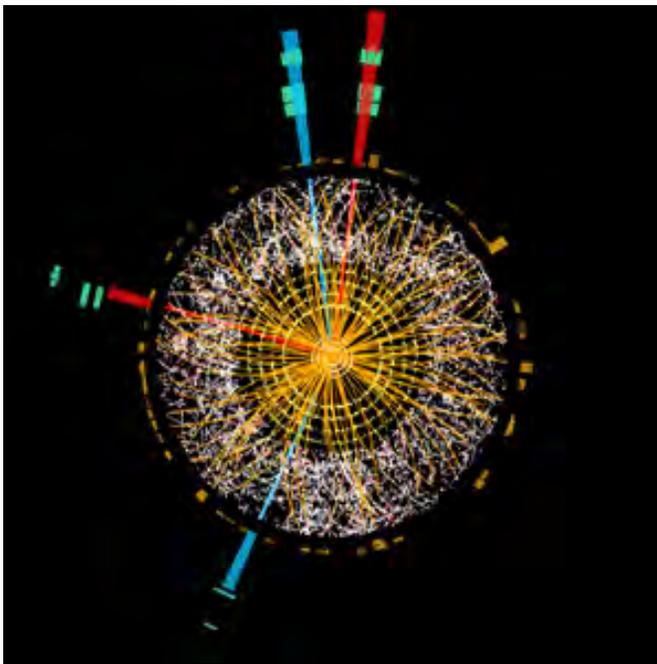
Tremendous Progress

- Think back just ten years ago ...
 - Immature physics case
 - Incomplete technical designs
 - Divided community
 - No host nation

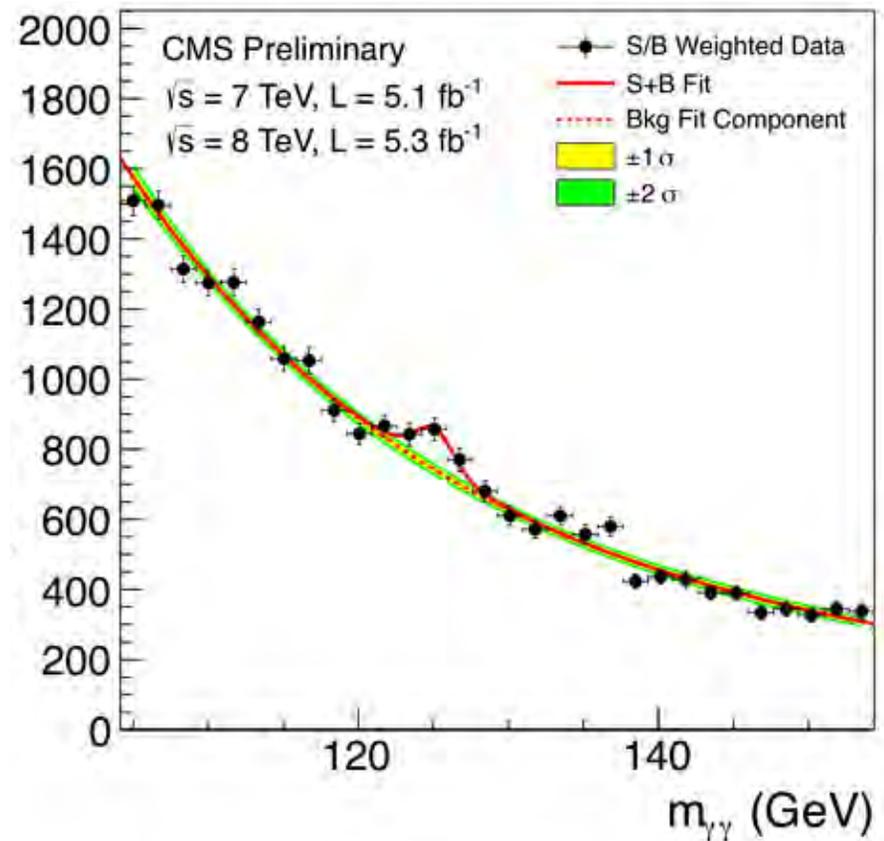
- Today, all this has changed!
 - The pieces seem to be falling into place
 - There is a palpable sense that the dream might well become real ...

Physics Case

- The discovery of a 125 GeV Higgs has opened the door to the ILC

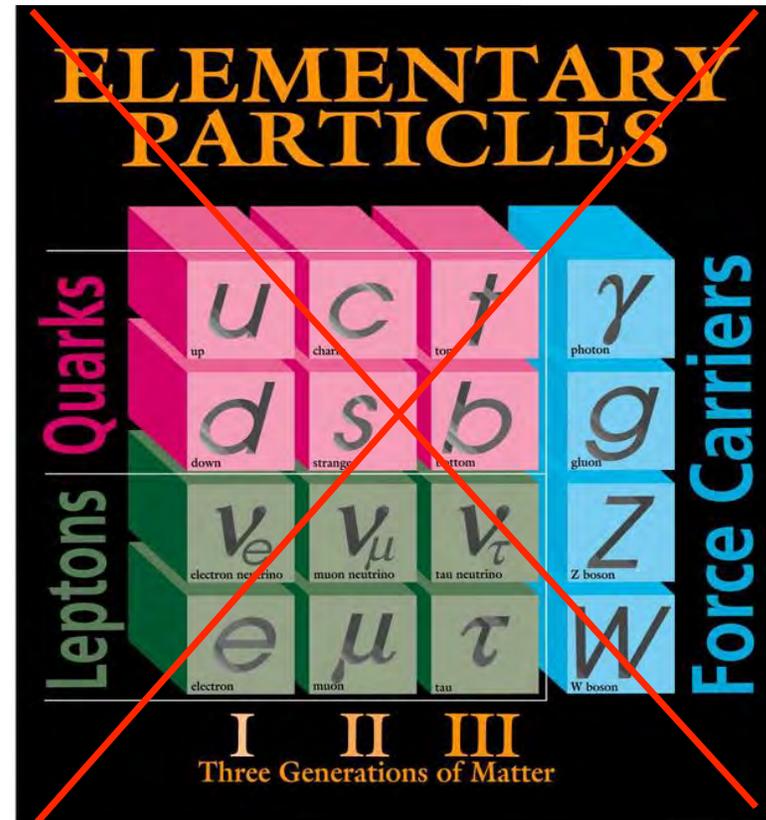


ATLAS and CMS



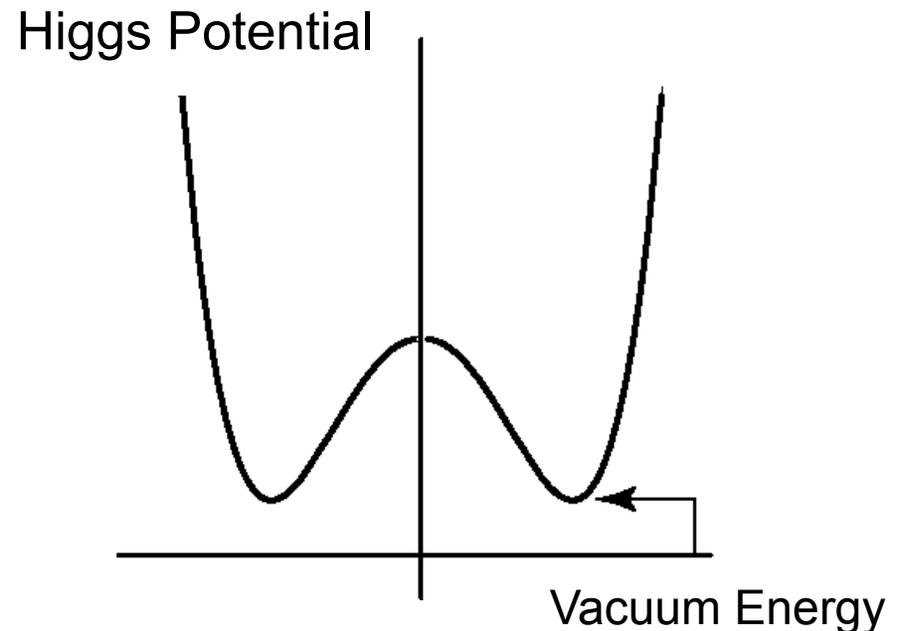
Physics Case

- A Higgs is a totally new form of matter – not a quark, not a lepton, not a gauge boson ...
 - One that turns the Universe itself into a superconductor!



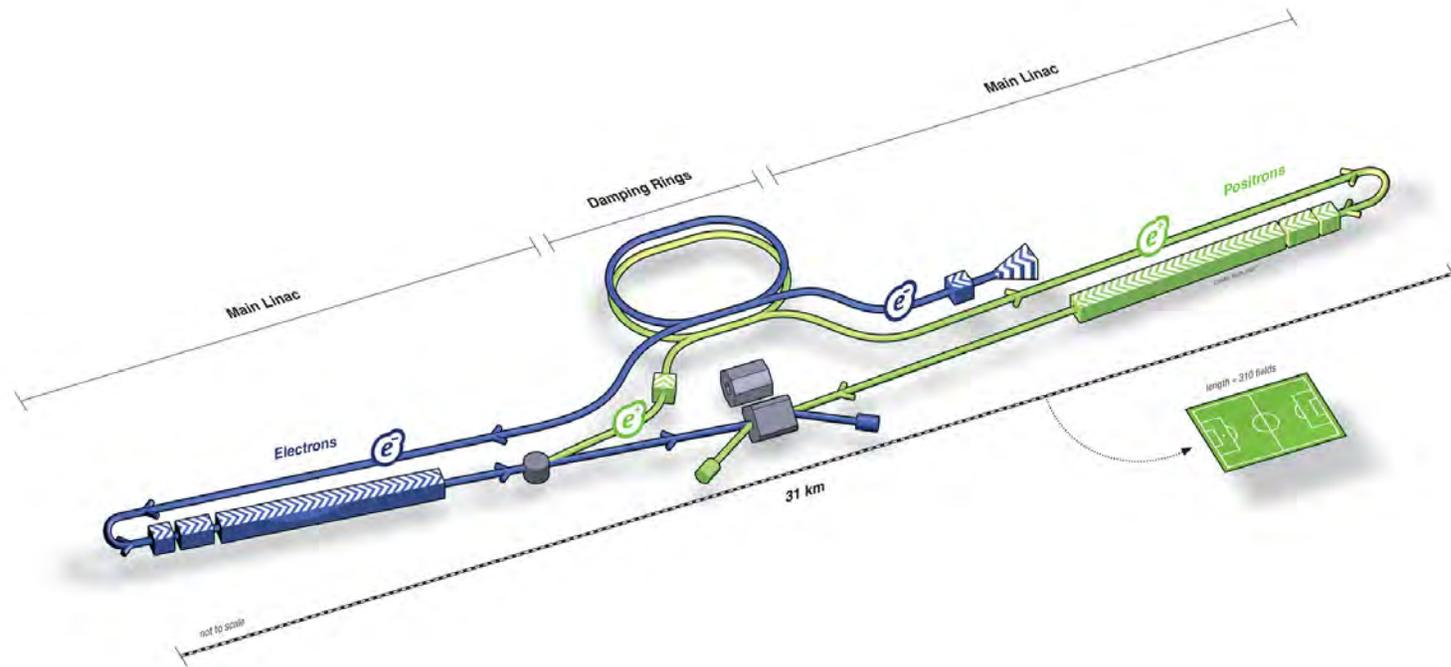
Physics Case

- We need the ILC to carry out model-independent precision studies
 - Not to “test the standard model” – but to look beyond it ...
- Is the new particle a portal to the hidden world of dark matter and dark energy?
- What is it telling us about the Universe?



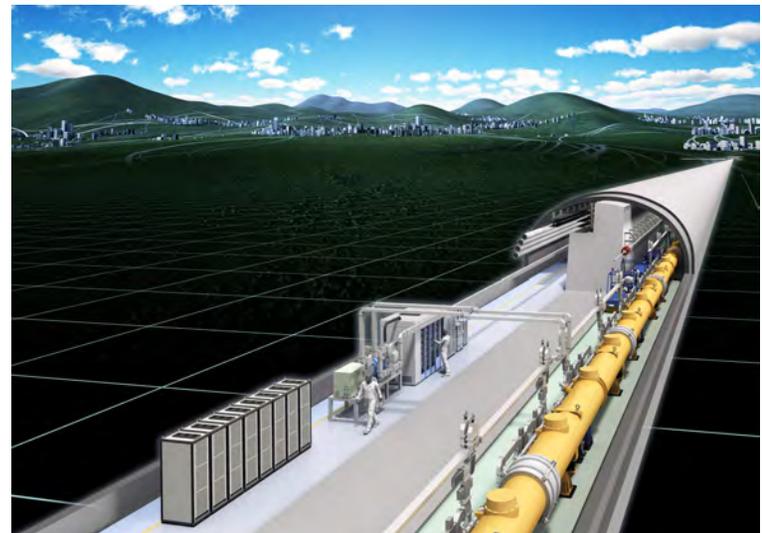
Technical Design

- On June 12, the GDE and the RD will release the ILC *Technical Design Report*
 - What an accomplishment!



Technical Design

- Under the leadership of Barry Barish and Sakue Yamada, the team overcame challenge after challenge ...
 - From the damping rings to the main accelerator to the final focus to the detectors themselves
- As a result of their work, we now have a machine that we know we can build!



Technical Design

- Just an example:
 - A worldwide effort succeeded in developing cavities with a gradient of 35 MV/m +/- 20%, keeping $\langle 35 \text{ MV/m} \rangle$ with a production yield of $> 90\%$
 - The effort relied on teams from Europe, Asia and the Americas
 - It was a heroic achievement, one that validated the original dream of Bjorn Wiik, as carried forth by the TESLA collaboration



Technical Design

- A quote from Norbert Holtkamp, chair of the cost review team:

“In responding to the charge, the review team assessed the overall quality of the design and the cost estimate and determined that it is sufficient to begin the preparatory activities for construction and to steer the future R&D program.”

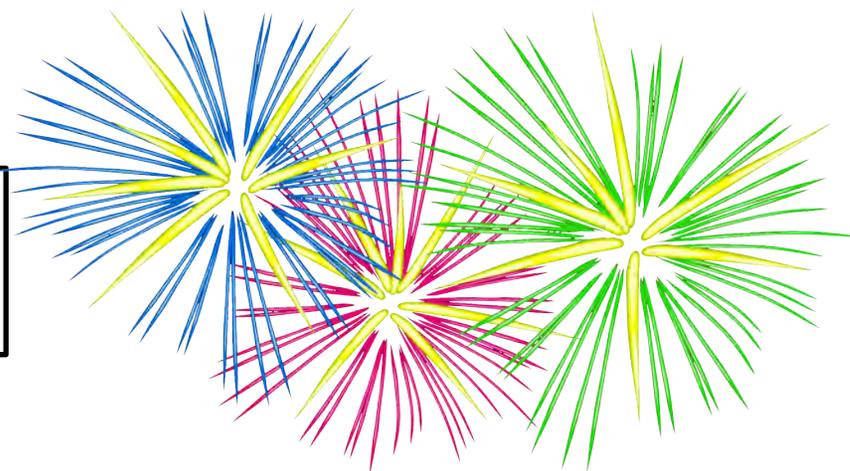
“The team also concluded that the quality of the TDR and its associated cost document, as well as the supporting documentation, is sufficient to begin negotiations among contributing parties and government agencies to determine how to execute the project.”

Technical Design

- Continuing the quote:

“As compared to other projects of similar scale (ITER, LHC, ATLAS, CMS, ALMA, XFEL, FAIR, ESS, SSC) the quality of the documentation presented by the GDE team is equal or superior to that utilized to launch into a similar process.”

The ILC is good to go!



Consistent Message



Here is a case where $1 + 1 \gg 2$

Consistent Message

- The LC community has proven that it can make hard decisions to advance its cause
 - The ITRP technology downselection was a difficult experience for all involved
 - The recent formation of the LCC was also courageous
 - Both were the right thing to do
- The LCC will allow us to speak with one voice, advancing one consistent message:
 - ILC is ready now, and CLIC is being developed for the long-term future

Consistent Message

- We are fortunate the ICFA has recruited a strong leadership team, charged with realizing a linear collider
 - Linear Collider Board
 - Chair: Sachio Komamiya
 - Linear Collider Collaboration
 - Director: Lyn Evans
 - Deputy Director: Hitoshi Murayama
 - ILC: Mike Harrison
 - CLIC: Steinar Stapnes
 - Physics and Detectors: Hitoshi Yamamoto

Host Nation

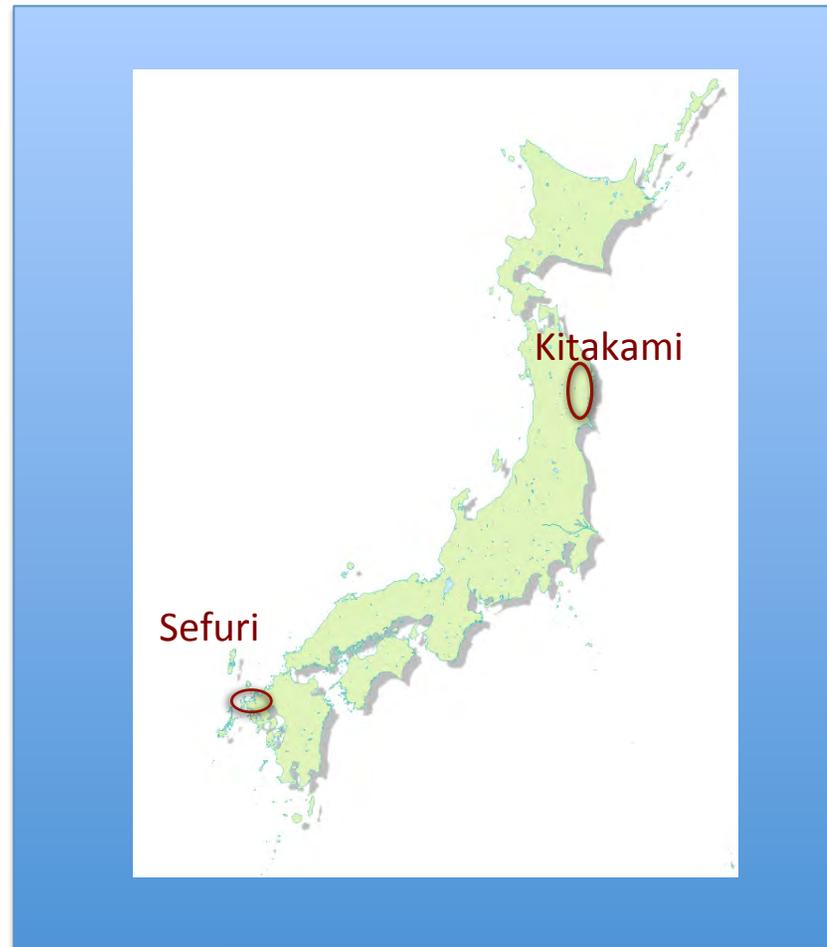
- Japan is preparing to step forward





Host Nation

- Two sites, selection this summer or fall



Host Nation

- Much excitement in Japan



Electron and Positron





So what are we going to say when Japan comes calling?

“Oh no, we are too busy upgrading the LHC?”

“Oh no, we want multiple neutrino programs?”

Or, are we going to recognize that major opportunities come just once in a lifetime?



Host Nation

- Our facilities are so expensive that we need to raise money from nontraditional sources
- Japan is in the process of deciding that it is in their national strategic interest to host the ILC
 - That would inject new money into the field
- I believe that it is in all of our our interest to make sure they succeed
 - I wonder, though, whether we have the wisdom and the leadership to make it happen

- What is leadership today?

“In the flat world that is taking shape, leadership ... no longer consists of single-handed efforts to maintain dominance in a particular field. Rather, leadership emerges from the creativity and initiative needed to organize international teams of collaborators to pursue projects that are beyond the capability of any one country.”

Harold Shapiro, *Charting the Course for Elementary Particle Physics*, NRC, 2006

Host Nation

- We need to think more broadly
 - CERN was founded on the ashes of war by a set of visionary physicists
 - And today, we are beneficiaries of their foresight



Host Nation

- So perhaps today, at the dawn of the Asian century, the world needs Japan, China, Korea, India, Vietnam all collaborating on a peaceful endeavor
 - The SESAME light source is attempting something similar in the Mideast
 - Its current members include Bahrain, Cyprus, Egypt, Iran, Israel, Jordan, Pakistan, Palestinian Authority, and Turkey
 - Where else but science could these nations meet on common ground?



Summary

- With the ILC, we have a strong physics case, a machine we can build, an experienced management team, and a nation willing to host
 - What more do we need?
 - We need leadership, both in the community and in the government
 - And so as the ILCSC stands down, I ask that each and every one of you step up and assume the mantle of leadership
 - We cannot afford to wait!

