



# ILC Physics, Detectors, & the Future

Preparing for Snowmass  
& info on the June 12 TDR Launch Event

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SiD Workshop  
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# ILC Physics, Detectors, & the Future

\* Snowmass white papers

\* Suggestion to renew the European Strategy ILC/CLIC physics paper for submission to the Snowmass planning process

“The Physics Case for an  $e^+e^-$  Linear Collider”

- J.B., R. Godbole, F. Le Diberder, M. Thomson, H. Weerts, G. Weiglein, J. Wells, H. Yamamoto
- arXiv:1210.0202

\* June 12 ILC TDR Launch Event

# Snowmass Planning Process

- \* Snowmass Energy Frontier study organized into topical working groups:
  - HE1: The Higgs Boson
  - HE2: Precision Study of Electroweak Interactions
  - HE3: Fully Understanding the Top Quark
  - HE4: The Path Beyond the Standard Model
  - \_ - New Particles, Forces, and Dimensions
  - HE5: Quantum Chromodynamics and the Strong Force
  - HE6: Flavor Mixing and CP Violation at High Energy
- \* Each will write a summary report describing the community consensus at the end of the process
- \* Summary reports will be input to the DOE P5 process

# ILC at Snowmass

- \* The ILC must be represented correctly and favorably in these reports – they must conclude that the ILC is a valuable scientific opportunity.
- \* We, the ILC community, are in the best position to prepare input to the topical groups, making sure that the working groups and their conveners have the correct and most persuasive information.
- \* The DBD Physics Volume is a resource for this, but it is inclusive, covering many topics in some depth.
- \* It would be better to prepare brief, readable documents targeted at each topical working group.

# White Papers

- \* The DBD is a starting point for input to Snowmass
- \* But the LHC results are being updated, and ILC studies continue
- \* We should prepare and present to the topical working group conveners focused **WHITE PAPERS** on each topic, with the most up-to-date statement of the ILC role in the future HEP program – by June-July All-hands EF meeting w/ talk
- \* Key topics
  - Higgs (HE1)
  - Precision Electroweak (HE2)
  - Top (HE3)
  - New Particles/SUSY (HE4)

# Higgs (HE1)

## \* Snowmass conveners:

- Sally Dawson (BNL), Andrei Gritsan (Johns Hopkins), Heather Logan (Carleton), Jianming Qian (Michigan), Chris Tully (Princeton), Rick Van Kooten (Indiana)
- Encouraged by email exchange with Rick

## \* ILC white paper authors:

- Confirmed: David Asner, Tim Barklow, Spencer Chang, Keisuke Fujii, Shinya Kanemura, Akiya Miyamoto

# Precision Electroweak (HE2)

## \* Snowmass conveners:

- Ashutosh Kotwal (Duke), Michael Schmitt (Northwestern), Doreen Wackerath (SUNY Buffalo)
- Encouraged by phone conversation with Doreen

## \* ILC white paper authors:

- Confirmed: none
- Also invited: 1 Canadian experimentalist (declined), 1 European experimentalist, 1 American theorist, 2 Asian theorists

# Top (HE3)

## \* Snowmass conveners:

- Kaustubh Agashe (Maryland), Robin Erbacher (UC Davis), Cecilia Gerber (Illinois-Chicago), Kirill Melnikov (Johns Hopkins), Reinhard Schwienhorst (Michigan State)
- Encouraged by email exchanges with Kaustubh and Robin

## \* ILC white paper authors:

- Confirmed: David Asner, Yoichiro Kiyo, Roman Poeschl, Yukinari Sumino, Marcel Vos
- Also invited: 1 European theorist



# New Particles/SUSY (HE4)

## \* Snowmass conveners:

- Yuri Gershtein (Rutgers), Markus Luty (UC Davis), Meenakshi Narain (Brown), Liantao Wang (Chicago), Daniel Whiteson (UC Irvine)
- Encouraged by email exchange with Meenakshi

## \* ILC white paper authors:

- Confirmed: Howie Baer, Jenny List, Maxim Perlstein
- Also invited: 1 American theorist, 1 European experimentalist, 1 Asian theorist, 1 Asian experimentalist

# Suggestion to Update European Strategy Document

- \* “The Physics Case for an  $e^+e^-$  Linear Collider”
  - Joint ILC/CLIC statement
  - J.B., R. Godbole, F. Le Diberder, M. Thomson, H. Weerts, G. Weiglein, J. Wells, H. Yamamoto
  - Commissioned by and submitted to European Strategy (arXiv: 1210.0202)
  
- \* CLIC Physics & Detector Exec Team suggestion – this week
  - email from Lucie
    - submit again a common ILC/CLIC document to Snowmass based on a revision of the European document.
    - Authors – same team + 2 added USA members, with chair assumed by a USA member.
    - Comments?

# June 12 Event



SEARCH



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## The International Linear Collider - A World-Wide Event - From Design to Reality

The official and worldwide handover ceremony of the *Technical Design Report* for the International Linear Collider will happen on 12 June 2013 in all three regions of the ILC.

Many years of globally coordinated R&D culminate in the *Technical Design Report*, which presents the latest, most technologically advanced and most thoroughly scrutinised design for the potential next-generation particle collider to complement and advance beyond the physics of the Large Hadron Collider at CERN. In a global event starting in Japan and ending in the United States, scientists and their guests will celebrate this achievement in symposia, public events, receptions and a series of handover ceremonies.

Detailed programmes for the three regional events, including speakers and timing, will become available soon. Registration will open in January.

<http://www.linearcollider.org/events/2013/ilc-tdr-world-wide-event>

# June 12 Event

- \* Official and worldwide handover ceremony of ILC *TDR* for the International Linear Collider
- \* 12 June 2013 in all three regions of the ILC.
- \* Many years of globally coordinated R&D culminate in the *TDR*, presenting the latest, most technologically advanced and most thoroughly scrutinised design for the potential next-generation particle collider to complement and advance beyond the physics of the Large Hadron Collider at CERN.
- \* In a global event starting in Japan and ending in the US, scientists and their guests will celebrate this achievement in symposia, public events, receptions and a series of handover ceremonies.
- \* Detailed programmes for the three regional events, including speakers and timing, will become available soon.

# June 12 Program

- \* Detailed programmes for the three regional events are being prepared
- \* Order of programs
  - Japan (KEK or Tokyo)
  - Europe (CERN)
  - US/Canada (Fermilab)
- \* Each region
  - Hand-offs between regions
  - 2 hour symposium of talks on physics, accelerator, detectors, and spin-offs
  - Symposium concludes with hand over of the TDR from GDE rep to ICFA rep
  - Reception
  - Public Lecture

# US/Canada Program at Fermilab

\* Within the Fermilab Users' Annual Meeting

\* Tentative program

- 3:40 – Hand-off from Europe and introduction to the program
- 3:50 – ILC Physics
- 4:10 – ILC Detectors
- 4:30 – ILC Accelerator
- 4:55 – ILC Accelerator and Detector Technology in Industry
- 5:15 – Superconducting RF as an enabling technology
- 5:35 – presentation of the TDR by the GDE Director to the ICFA Chair
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- 5:45 – Banquet and start of poster session
- 7:45 – end of poster session
- 8:00 – Public lecture
- 9:30 – Reception – cookies and soft drinks
- 10:30 – end of evening

# SLAC-based Participation in Event

- \* Welcome program at SLAC if there is interest
- \* Should be planned soon if it is to be announced along with the other parts of the program
- \* Many possibilities
  - Join through video connection
  - Plan separate program – with linkage
  - ....

# Summary

## \* ILC

- White papers are being planned
- 4 topics (Higgs, Precision EW, top, New Particles/SUSY)
- Welcomed by the Energy Frontier topical WG conveners

## \* ILC/CLIC

- CLIC Physics & Detector Exec Team suggestion
- Update the joint submission to the European Strategy and submit it to the Snowmass Planning Process

## \* June 12 TDR Launch Event

- Planned for sequence of celebrations in each region
  - Tokyo/KEK, CERN, Fermilab
  - Symposium of technical talks / reception / public lecture