

# **RD's Report on the status of physics/detector activities**

**ILD Workshop  
@Fukuoka**

**Sakue Yamada  
May 23, 2012**

# Contents

**Where we are?**

**Interim report printed**

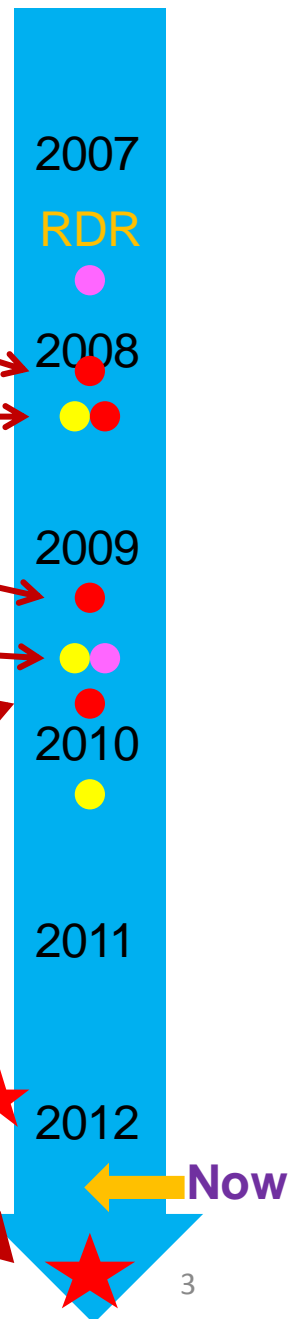
**Plan and Status of DBD**

- **Structure of DBD**
- **Plan**
- **Recommendations of IDAG (Daegu)**

**Post 2012 scheme for physics/detector**

# The time line of the LOI process

- Oct. 2007: **Call for LOIs was made by ILCSC**  
**appointment of RD to conduct the process**
- Jan. 2008: Detector management was formed
- Mar.2008: IDAG formed, 3 LOI groups known
- Mar.2009: 3 LOIs submitted
- Summer 09: IDAG recommendation for  
validation and ILCSC's approval
- Oct 2009: Work plan of the validated groups
- **End 2011: Interim Report completed**
- **End 2012: Detailed Baseline Design Report**

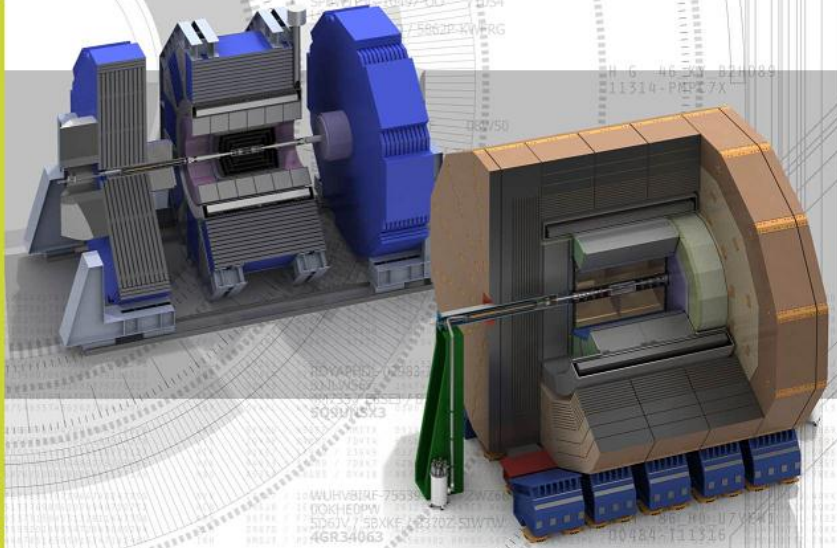
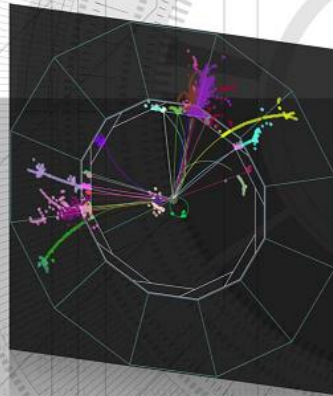
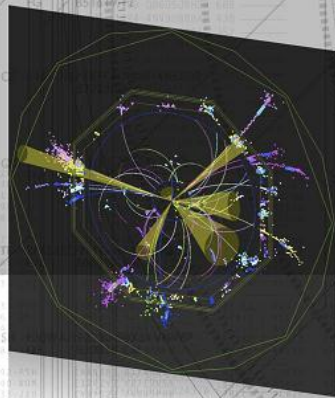


# Interim Report was completed last December, and distributed by now

ISSUED BY **ilc** international linear collider

## International Linear Collider Physics and Detectors

2011 STATUS REPORT



International Linear Collider Physics and Detectors 2011 STATUS REPORT  
ilc-REPORT-2011-020  
ilc

# Lessons from the Interim Report

## (to be considered for DBD)

- **Editing required big effort (of the communicators)**  
(many authors, technical words, abbreviations, physics units → *may be less for DBD.*)
- **Some items took time: → *Keep in mind***
  - high quality figures**
  - checking of author list/institution names,**
  - additional information** (the funding agencies to acknowledge, report numbers of supporting labs.)

# Detailed Baseline Design report

**DBD is important !**

Our 5 years efforts will be summarized,  
and *will be the jumping board* for the next step.

**i.e.**

Together with **GDE's TDR**, **DBD** will make a part  
of the project proposal when the consensus is  
reached that ILC is the LC to be built.

**LHC** may bring a new clue hopefully this year.

*We plan to keep the target date of DBD.*

# Expected Readers

- **Physicists in HEP and related field**  
*Detailed and precise information will be given to convince experts.*
- **For non-experts in the wider community,**  
we will make, together with the GDE,  
the **Executive Summary volume of TDR/DBD**  
and an outreach document.

# DBD will have 2 volumes

**Physics volume** (80-100 pages)

*describes physics case for ILC*

**Detector and simulation volume**

(~350 pages)

*describes the feasibility of the detectors  
for solving the aimed physics questions.*

***It has***

**introductory chapter +**

**common issue chapter** (~50 pages)

**2 detector chapters** (150 pages for each).



# Author groups to make DBD

## Physics volume:

a group of physicists convened by Michael Peskin

(The base is the Physics CTG but invites wider contribution. The group started early last year.)

The group is studying the LHC results and waits for new ones with better statistics.

The first version will be made this Summer (after ICHEP12) and will be updated, if needed, toward the DBD completion.

# Author groups to make DBD (cont'ed)

## Detector and Simulation Volume:

### The introductory/common issue chapters:

the management, the common task groups  
and relevant experts

### The detector chapters: two detector groups, ILD and SiD

These can be regarded as the advanced  
updates of the LOI contents.

# General guidelines for the detector volume

- **Each group will write**  
its detector concept, design, R&D of the components, simulation for benchmarks, cost estimation, and so on.
- **These chapters need to be convincing for addressing the physics aims.**
- *We wish to make the case for ILC detectors.*
- **The groups are free about where to put emphasis.**
- **Those items common for the both detectors will be described in the foregoing introduction and common chapters.**

# DBD Format WG

**This group coordinates the format and contents of the detector volume.**

- **Members:**

(ILD) T. Behnke, Y. Sugimoto

(SiD) P. Burrows\*, M. Stanitzki

(Management)

J. Brau, J. Fuster, H. Yamamoto, S. Yamada

*(\* P. Burrows will be the contact to the TDR'S editors.)*

**This group will work also as the editing team.**

**The minutes of this WG can be accessed through our web page. (ILC > Physics and Detectors > detectors > DBD )**

# Some of the discussions of the Format WG

- Due dates of the mile stones

Outlines: End March (finished)

IDAG monitoring them during KILC12, in April

*First draft: Sept. 21*

**IDAG monitoring during LCWS12 in October.**

*Final draft: Dec. 21*

**(We plan to submit sub-final draft to PAC**

**before its next meeting, December 13/14.)**

- **We collect the signatories again.**

**Where to place the author list is not fixed yet.**

(E.g. RDR had all the authors repeated in each volume.)

# IDAG monitoring & recommendations (Daegu)

- The outlines of the introductory chapter and the two detector chapters were discussed.

ILD/SiD prepared detailed documents of contents of about 50 pages in advance.

- IDAG met **with the management, the two groups (SiD/ILD), the software CTG members and Physics CTG convener.**
- IDAG gave us several suggestions **on the organization of the contents, and on the schedule and production procedure.**

# IDAG recommendations include

- Making the common issue chapter
- Moving more common items from the individual detector chapters to the introduction/common issue chapters
- **Writing these chapters very soon so that the detector authors know what are covered there.**
- *Bringing a list of future R&D for improvement in the common issue chapter not in each detector chapter.*  
**(The detector chapters are better emphasize that using today's technology excellent detectors can be built for ILC.)**

## IDAG recommendations (cont'ed)

- **For each detector part, detailed page allocation needs to be made soon.**
- **Regarding the new benchmark simulation, to compare the new results of the two groups in advance, e.g. before the LCWS12,**
- **Summarize the simulations for 500 GeV first before presenting the new 1 TeV benchmarks**  
*(The primary focus of the DBD will be achieving a robust design for 500 GeV Physics.)*



# Contents of the introduction

*The details were organized by J. Fuster and will be finalized in the Format WG next week.*

- **Physics reach (This is a very brief summary of the physics volume).**
- **General requirements on detector performance at ILC**
- **Machine BG and beam instrumentation**
- **Benchmark processes**
- **The necessity and the contrast of the two detectors**
- **Description of the physics/detector activity during this LOI period; mile stones, organization, IDAG,....**

## Items covered in the common issue chapter

- E.g. MDI matters and interfacing matters with the accelerator, push-pull in general
- Beam instrumentation
- Det. R&D activity, common technologies for the both detectors, spin-off cases
- Engineering tools,
- Common simulation and software tools
- Cost estimation methodology

# Post 2012 program

During the KILC12

there was a strong hope that LHC bring new physics which pushes ILC forwards.

It matches very well with the completion of TDR/DBD to proceed to the next step.

***ILCSC is now discussing the post 2012 scheme.***

**Paris 2010, Mumbai 2011, Melbourne 2012**

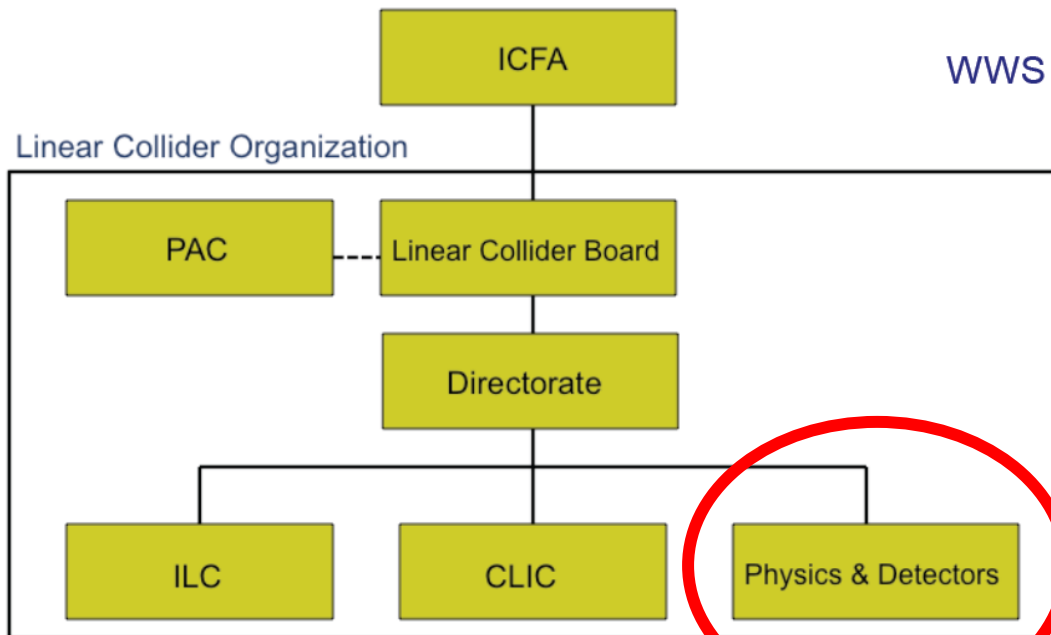
Present GDE/RD scheme will be extended by half a year till mid 2013. The new scheme will start from Jan.2013.

# Post 2012 scheme being considered by ILCSC

- In the planned scheme the detector/physics organization contains both ILC and CLIC activities.*

Jon Bagger @Granada (LCWS11)

## Possible Organization



# Considerations

- Preparatory discussion was made once in the ILC-CLIC Joint WG.
- Some grass-root discussions have been made between the ILC people and CLIC people.
- **It does not look simple so far to design a structure which is agreeable to everybody.**

*On the ground level, there are cooperation.*

*The same concept groups, which are autonomous & independent, are participating in both ILC and CLIC.*

# Differences

- *There are also differences, which cause difficulties.*
- **ILC and CLIC are different accelerators.**  
**Energy range (physics),**  
**Stage of R&D (for acc. and detector)**  
**Time range of the project**

# The ILC detector activity

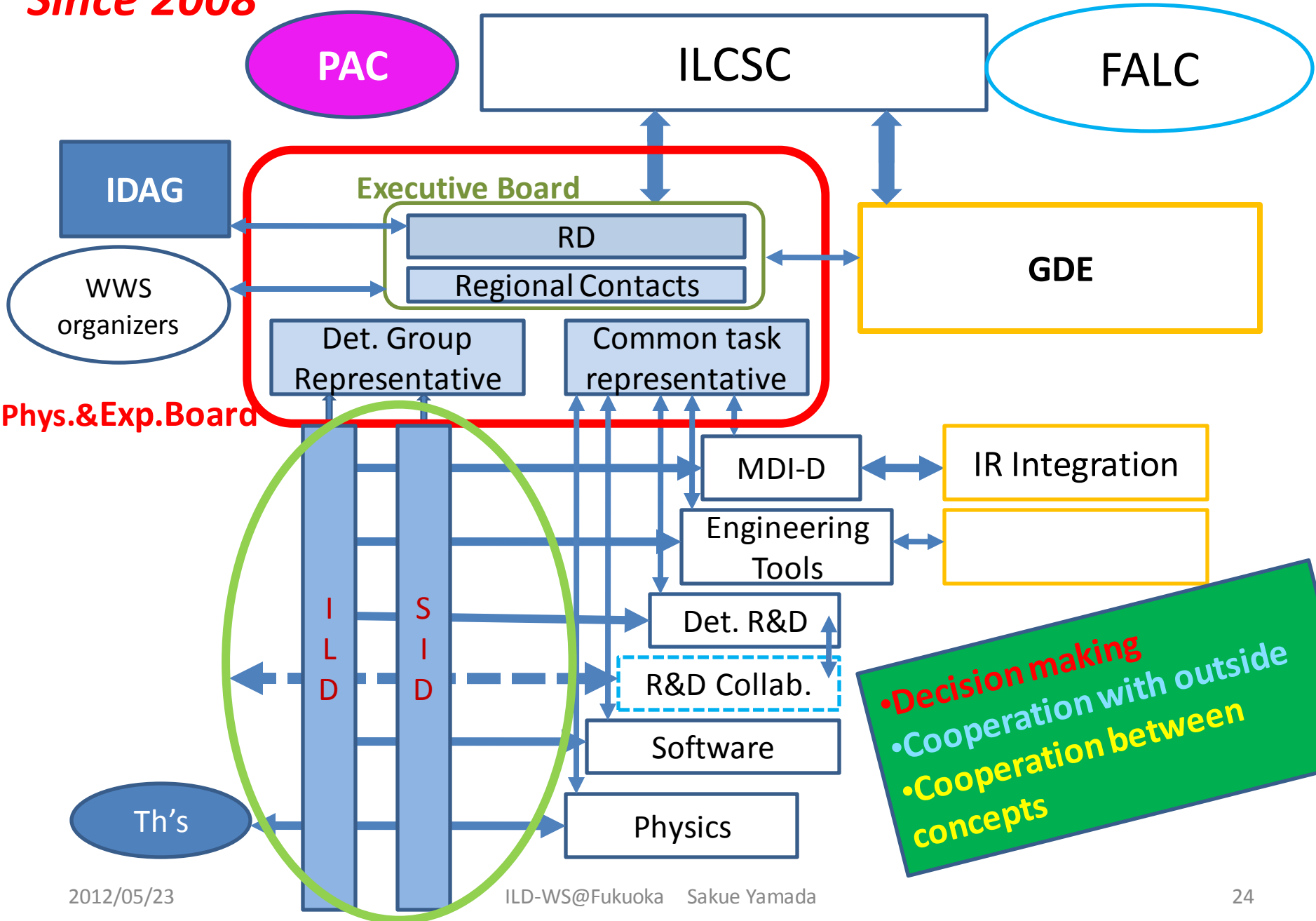
**ILC community wishes ILC be realized soon when it is possible. (In particular if Higgs candidate is found)**

**ILC detector/physics activity has been organized fully globally and successfully through the LOI process under ILCSC.**

**Reminder---**

***With this organization and your effort on it, we reached to the present stage !***

*Since 2008*





# ILC detector activity

- This structure was formed by consulting ILCSC and all the regional steering bodies.
- It keeps good balance of participation regarding regions, concepts and laboratories.
- We reported regularly to ILCSC, and also were overseen by PAC.
- It has been working successfully & is coming its goal. (the call for LOI, validation, Interim Report, and final DBD report)
- Resources for R&D are secured by the participating groups. (The management respected these efforts.)

# Budget for the management

- **The management was supported by GDE's common fund provided from all the regions.**
- **It is used almost fully for IDAG which validated LOIs and monitors the efforts of the groups towards DBD.**
- **The budget is requested and reported to the FALC.**
- **Such international financial support was possible because we were organized.**

# ILC detector activity (cont'ed)

- **We believe a similar organization is needed, and wish to strengthen its function as we approach ILC realization**

**so that more work, including engineering, can also be supported by the common fund (if it is difficult otherwise).**

- **I.e., the management needs to be strengthened, too.  
(Evaluation mechanism for supporting)**
- **Similar cooperative activities like CTGs need to be continued.**

**E.g. closer link with the ILC accelerator colleagues will be required for MDI matters.**

# The role of the sub-director

- **The sub-director's role will be very important to organize the physics/detector activity further and to push the project for realization, together with the director.**
- **Sub-director will be a member of the LC-Board.**

# Remarks on designing for the 2012 scheme

- **With the differences of status and intension, it does not look easy to rapidly merge the ILC and CLIC detector activities, while it will be a good and necessary direction.**
- To compare, the accelerator part of the new scheme is in parallel for ILC and CLIC, and each party can continue without changing its internal structure immediately.
- **ILCSC thinks the change will be made *adiabatically*.**
- **We wish ILCSC looks into the differences further in detail to design the new scheme.**
- **We also need to consider in depth as well.**