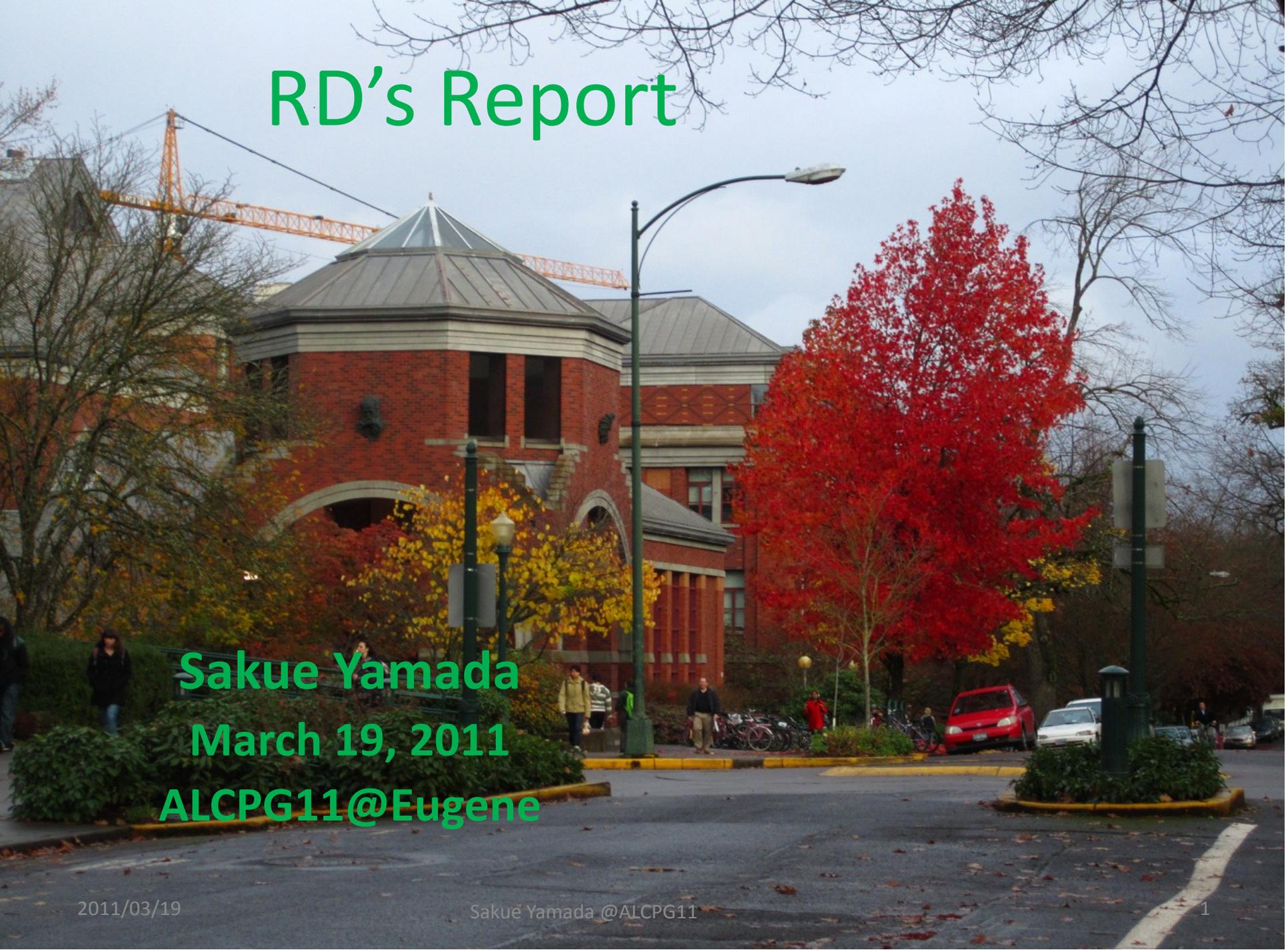


# RD's Report



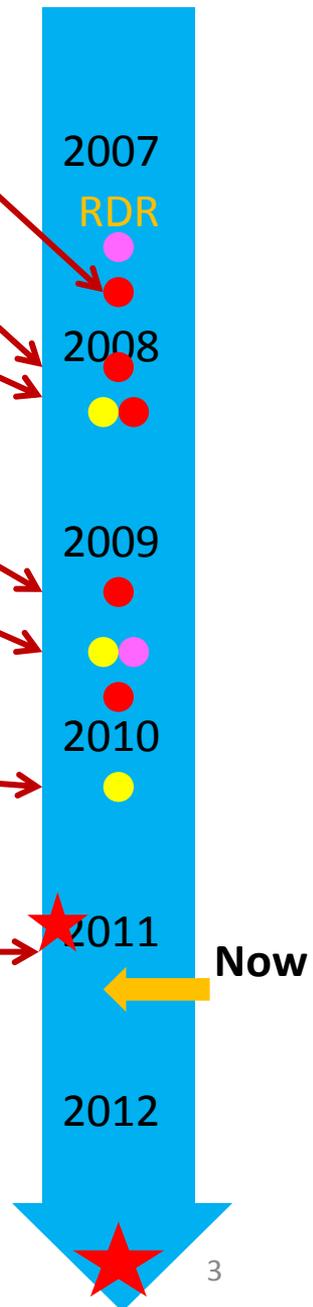
**Sakue Yamada**  
**March 19, 2011**  
**ALCPG11@Eugene**

# Topics

- Introduction
- Interim Report
- The detector groups
- Common Task groups
- Benchmark task force
- SB2009WG
- Cooperation with CLIC detector
- CPDG

# Time line of the LOI process

- Oct. 2007: **Call for LOIs was made by ILCSC**
- 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
- Mar:2009: **IDAG** began monitoring the progress
- **End 2010: Interim report(still being prepared)**
- **End 2012: Detailed Baseline Design Report and updated physics case for ILC**



# Interim Report

- We are now editing an interim report which can be published in a very similar form as the GDE's report.
- It is a good time to make such a report, passing the middle point till DBD completion.
- **Readers:**
  - **ILCSC:** to report the status of the detector activity
  - **Colleague physicists and funding agencies**
  - **Ourselves:** to review where we are in each activity

# Contents of IR

- **Physics prospect as seen at present**
- General introduction including chronological development of the LOI process since 2007 and on organization of the activity
- **Activity of the validated groups on R&D and the status of preparation towards DBD**
- **Update of physics simulation since RDR**  
*(Many simulations were made for LOIs.)*
- Activity of each common task groups
- Activity of SB2009 working group
- CLIC-ILC cooperation

## Interim report (continued)

- Preparation started last Autumn in Geneva.
- **Drafts are finished with contribution of many authors. They still need some adjustment.**  
*This editing part is delayed.*
- **The contents are status reports of on-going works.**
- **I.e. they contain accomplishments and incomplete items under study or plans towards the goal.**
- **Before printing, the drafts will be edited further by the communicators for easier reading.**
- **The length will be about 100 pages.**

# Detector groups

The groups are in the middle of detector R&D, design work and preparation for simulation in view of the 9 items to be considered.

E.g.

- R&D for critical components to demonstrate feasibility,
- Define baseline design including realistic support structure, holes, I/O cables, etc.
- Settle Push-Pull scheme
- Study new benchmarks
- Improved cost estimation

## Detector groups (continued)

- IDAG required the groups last October to report at the next IDAG meeting (here in Eugene) what will be included in the DBD and detailed plans to the goal.
- ILD and SiD will present them to IDAG, on Sunday 21 in their separate interview with IDAG. *These interviews are important.*

**We are aware the schedule or planning is linked with available resources.**

**ILCSC and PAC are informed of the following and understand that**

a) in order to keep the time line, resources are crucial and *there are uncertainties.*

***This might affect the accomplishment level of DBD.***

b) The detector groups wish to continue R&D after completing the DBD for improvement and for feasibility confirmation of better solutions.

***(This is crucial also to keep the community together until ILC is realized.)***

# Known resources situation

- In Europe new budget, AIDA, started for LHC-upgrade, CLIC&ILC.
- In US, while the present funding for universities is available till FY1012, the funding scheme is changing. **Joint LC approach (ILC/CLIC/muC ) is being proposed for post-2012 activity.**
- In Japan, the major budget (grant) for universities terminates very soon. A new application was made. It is under examination.

# Resources (continued)

These resources should be obtained

*in competition with programs of other colliders or of even wider research fields.*

➔ ILC and its physics need to be attractive and powerful enough to be successful in competition.

## Engineering support:

- We made a request for support for engineering help one year ago in the ILCSC meeting at BNL.
- Obtained a positive response and prepared detailed request last Summer in the meeting in Paris.
- **Waiting for any possible offers.**  
*(Some positive response from CERN.)*

# Common Task Groups

- **There are new development for each. This workshop can be a good chance for the members to meet.**

- **MDI group:**

The group is working on possible common solution for the push-pull scheme of ILD and SiD. The two detector groups are getting closer for a common scheme.

*This meeting is a good chance for the MDI group to discuss towards a final conclusion.*

- **Engineering Tool:**

An agreement was reached to use EDMS, which is common with the accelerator people.

**The next question is how to maintain the system.**

**This group will meet IDAG.**

## Common task groups (continued)

- **Detector R&D:**

The group was interviewed by IDAG last October, where the status of R&D of the most of the major components was presented.

*IDAG was content with the presented progress.*

- There are a number of spin-off of ILC originating detector R&D found in other fields and experiments.

*IDAG recognized this important and suggested to make a complete list of spin-off cases*

*so that they can be known widely.*

*This was reported to PAC by the IDAG chair, and to ILCSC by me.*

The same recognition was made by PAC and ILCSC.

**The group is working on the report.**

# Common Task Groups (continued)

- **Software Group:**

This group also was interviewed by IDAG last October.

The group is working effectively and IDAG was content.

**The group played an important role in the discussing for new benchmarks and is now preparing various tools for their simulations.**

*It also communicate with the CLIC simulation team.*

- **Physics Group:**

**The group lead the discussion to finalize new benchmark reactions and volunteered to make the physics chapter of DBD.**

(more details in later slides for new benchmark task force)

**The group made a significant contribution for the interim report.**

## Common Task Groups (continued)

### Next role of the physics CTG:

The group will further play a major role to make **the physics chapter of the DBD**, which is common to the both detectors, by sharing efforts with the detector groups.

(Michael Peskin volunteered to coordinate the writing of the chapter during the PEB meeting in Geneva.)

The physics chapter includes **update of ILC physics case from the physics volume of RDR, taking into account of the studies for LOI and the new information from LHC.**

The group organized a team of subject conveners, inviting more members, and preparation works will start in earnest this Summer. **It will be a center of focus at the Granada LC meeting in September.** The current plan can be found at:

<http://www.slac.stanford.edu/~mpeskin/PhysicsChapter.html>

People who are interested to contribute, please contact Michael Peskin or an appropriate subject convener.

# The task force for new benchmarks

- **Member:**

Tim Barklow(SiD), Mikael Berggren(ILD)

Akiya Miyamoto, Norman Graf (Software CTG)

Michael Peskin, Keisuke Fujii, Georg Weiglein (Physics CTG)  
(convener)

*To revisit the new benchmarks in view of the developing physics prospect, the resource of the detector groups and suggestion by IDAG*

**Report was made January 2011**

**Process to be studied**

**event generation, machine BG,**

**cooperation between ILD and SiD**

# Agreed conclusion of the task force

- **Three new process to be studied:**  
nu-nubar-higgs,  $W+W-$ ,  $t-tbar$ -higgs at 1 TeV
- **Each group repeats one of the LOI processes at 500 GeV with the final detector configuration**, and with the same event sample
- beam polarization taken into account
- All relevant physics back grounds to be included
- How to produce machine background
- Barklow, Berggren, Miyamoto will generate common sample of physics events and BG events.

# SB2009 WG

- The group was created after the ALCPG workshop in Albuquerque, 2009, convened by Jim Brau, and was very active till recently.
  - **It communicated with GDE on machine parameters, which worked well, and organized studies all possible consequences on physics.**
  - **It was important to make a quantitative comparison.**
    - Bremsstrahlung losses, Machine BG,
    - Higgs mass, cross section and branching ratios,
    - low mass SUSY, Stau detection,
    - Polarization
- Results were reported by Jim Brau last year at LCWS10, also at ILCSC (BNL), and at the two PAC meetings (Valencia and Eugene).**

## SB2009WG (continued)

- The group participated in the preparation of GDE'S BA workshops,
- and **most members participated in the two BAWs, particularly in BAW-2 at SLAC last January**, where many more people were actively engaged from the detector community and final results of the studies of physics implication were reported in a series of talks.
- The group submitted a written summary to GDE's PM.

# Common costing WG

- IDAG suggested ILD and SiD to use a common costing base.
- A costing WG was formed last year with experts of the both groups and an experienced advisor.

- **Members:**

**Marty Breidenbach, Kurt Krempetz(SiD)**

**Henri Videau, Tomoyuki Sanuki (ILD)**

**Sakue Yamada (management)**

**Peter Garbincius (Advisor)**

**Basic agreement is confirmed to use the same way of presentation as the accelerator costing, i.e. material and manpower are listed separately.**

For more precise details, consideration is under way.

e.g. **unit cost of material**

We learned there is an agreement for certain items for CLIC detectors.

Our plan is to extend the list.

# Cooperation with CLIC

- **Cooperation with CLIC detector is increasing, in view of CLIC CDR. Several members participate in the CLIC-CDR preparation.**

There are many common efforts on going. These are essentially grass-root cooperation.

Through the joint WG, we surveyed them and identified further possibilities for cooperation, e.g. **a workshop of experts is being organized on pulse-powering.**

**It is hoped strongly that once CLIC-CDR is completed, there will be more participation from the CLIC side for ILC DBDs.**

# Plan for post 2012 phase

- **ILCSC began planning the post 2012 phase last Summer. We welcome this.**
- **ILCSC chair, Jon Bagger, invited the detector community to comment on the CPDG document.**  
**Comments were sent by some individuals, WWS, SiD group and the detector management.**
- **We strongly wished to participate in the coming discussions to polish its content.**
- **During the last ILCSC, February 2011, discussion did not go that far, but hopefully next time.**

## Plan for Post 2012 (continued)

- *It is crucial that the detector community, or the user community of ILC, remain actively participating in the discussions, to continue R&D/physics studies after 2012, to reduce the difficulties which we have now and to prepare for the project realization.*
- ILCSC discussed about the possibility of international consortium as the intermediate scheme after 2012. This will be studied in each region by relevant ILCSC members by the next meeting in Mumbai.
- Consideration for the scheme in detail will be made after that.