



RD's Report

(update since LCWS08 in Chicago)

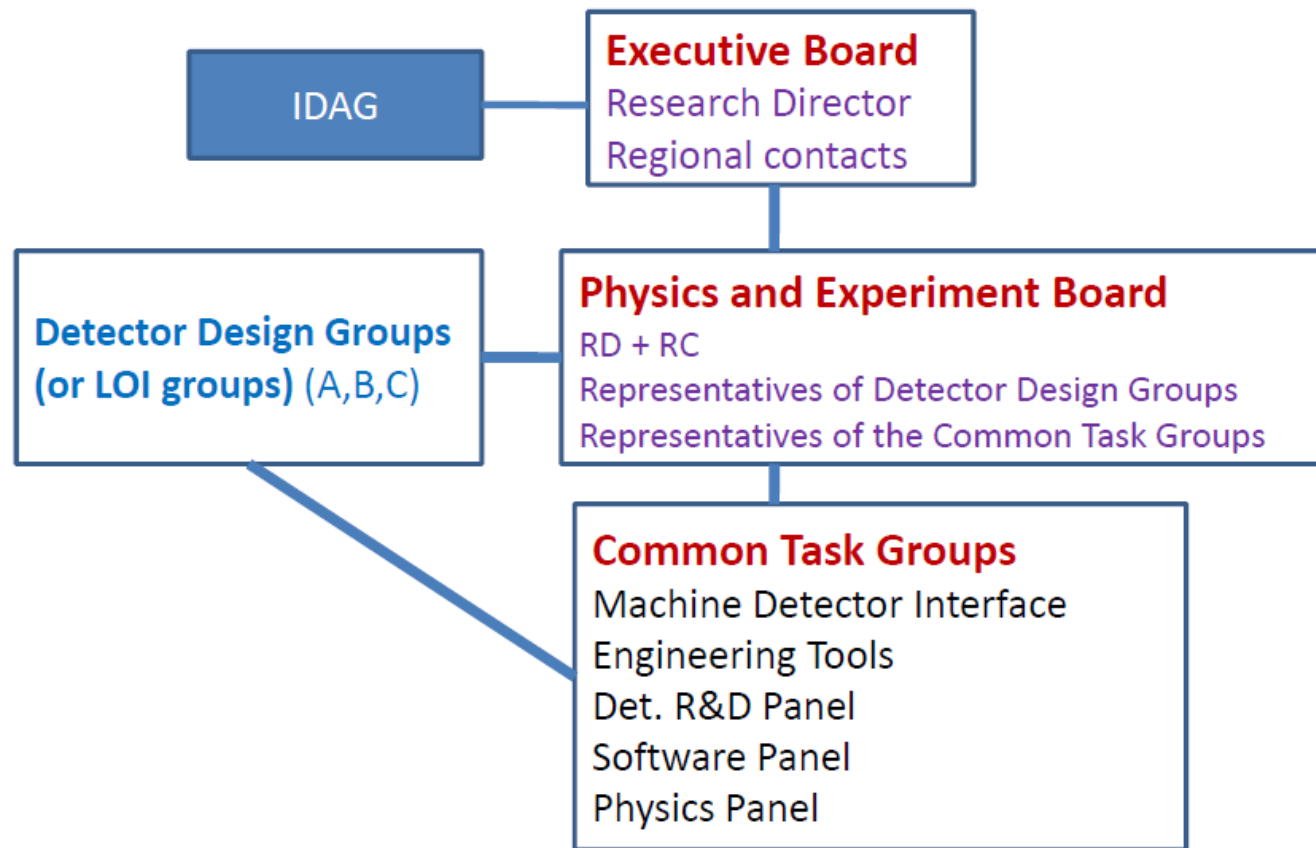
Sakue Yamada
April 17, 2009 @TILC09 Tsukuba

Topics

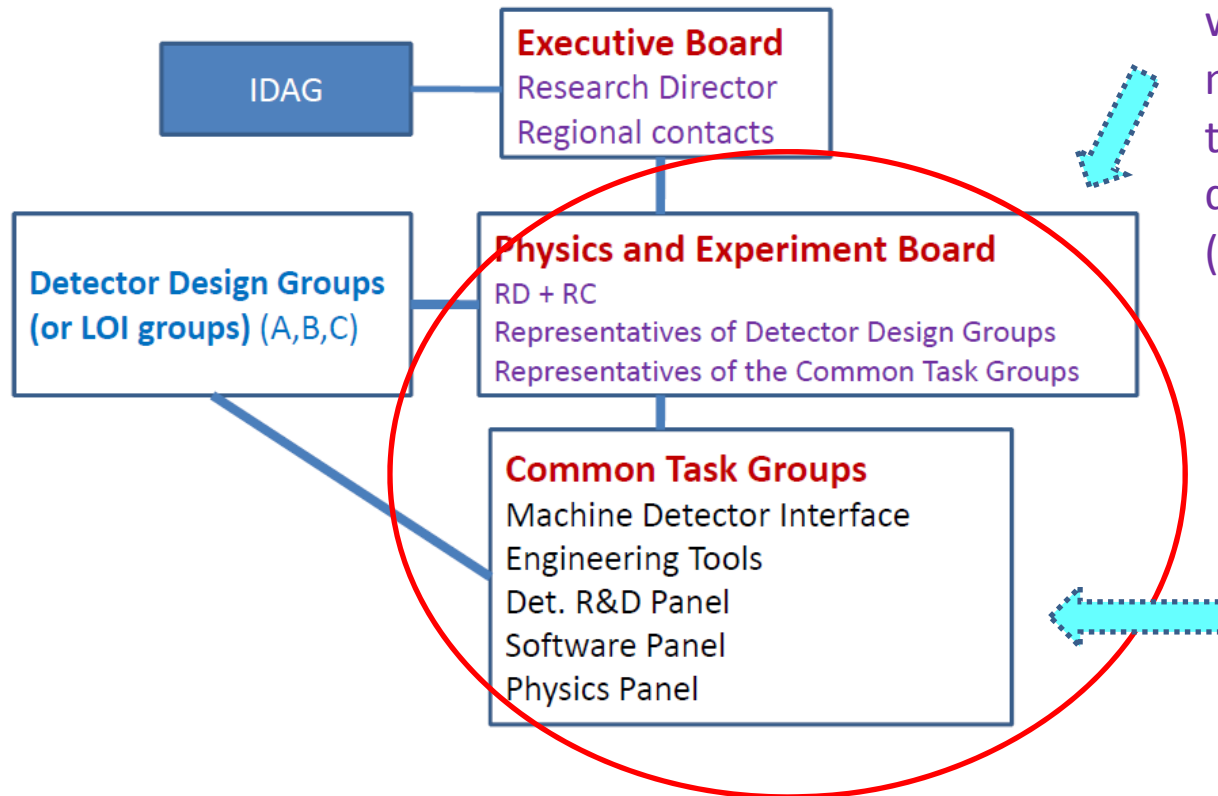
- Where are we ?
- LOIs were submitted
- IDAG's plan
- Common Task group activities
- Collaboration with CLIC
- How we proceed from here ?

Where are we?

The frames of the detector organization were filled and all the functions are working now..



Physics and Experiment Board and Common Task Groups



The members were known by the time of LCWS08 in Chicago, where it met first. Regular meeting is held monthly. All the important issues regarding detector are discussed here. (Minutes in the ILC web page)

The members of all the groups were named also till LCWS08. Many C.T. groups also made face-to-face meeting in Chicago to start the activity of the groups. (MDI group has been active about a year by now.)

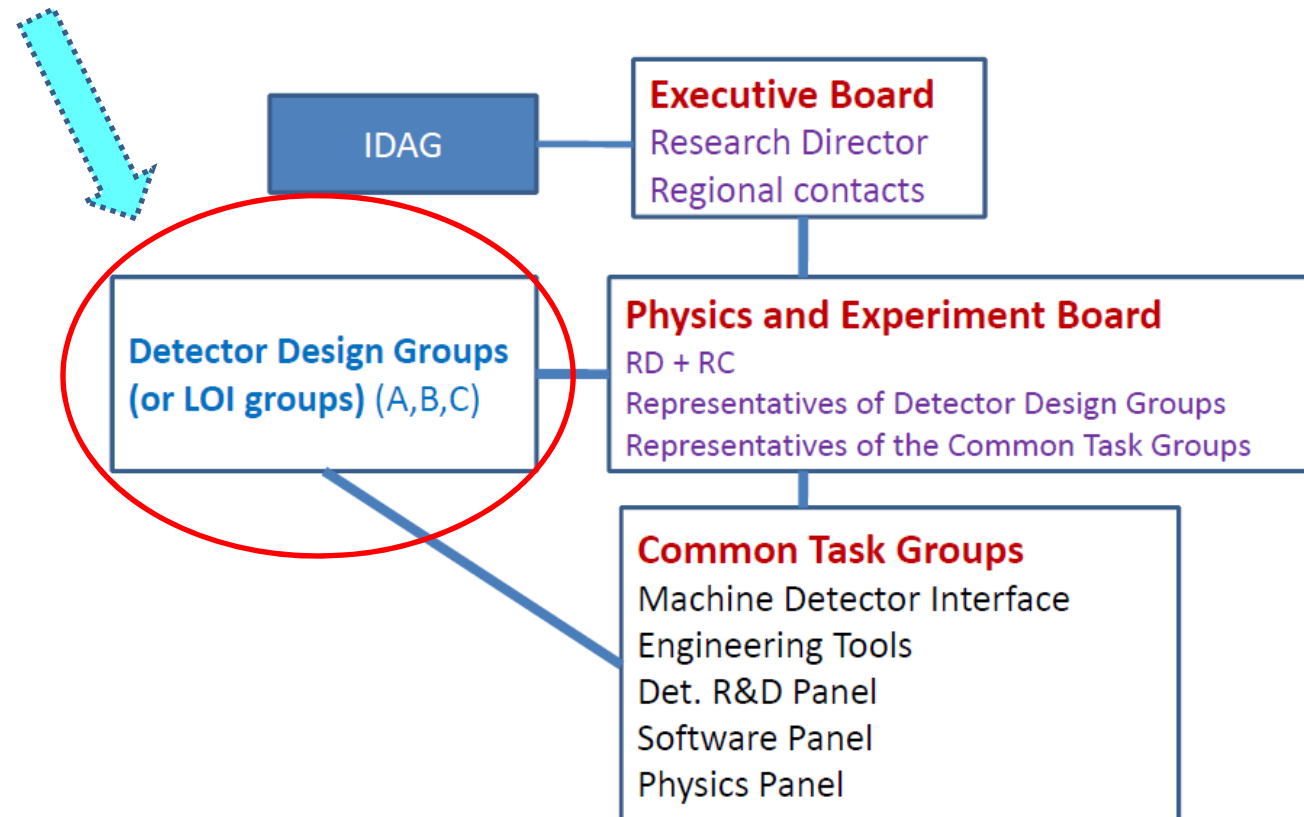
The Detector Design Groups submitted their LOIs successfully by the due date of March 31.

Congratulations !

Each group will present its LOI this afternoon during the ACFA plenary session.

The documents are made public by all the groups.

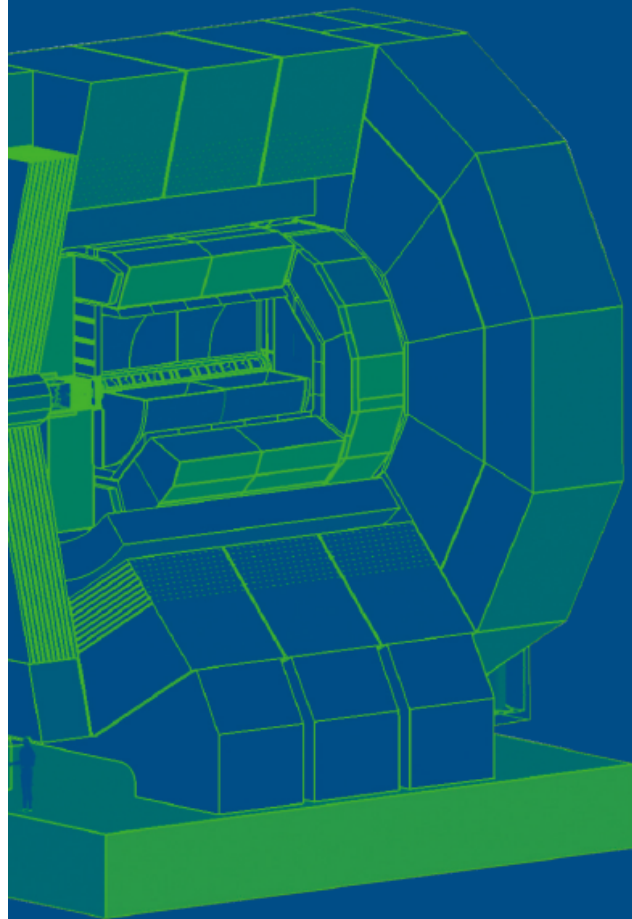
<http://www.linearcollider.org/cms/?pid=1000472>





The International Large Detector

Letter of Intent



by the
ILD Concept Group
March 2009

The ILD group

Location of LOI and supporting documents

<http://www.ilcild.org/documents/ild-letter-of-intent>

Introduction

Detector Optimization

Physics performance

Sub-detector system

DAQ and computing

Detector integration and MDI

Costing

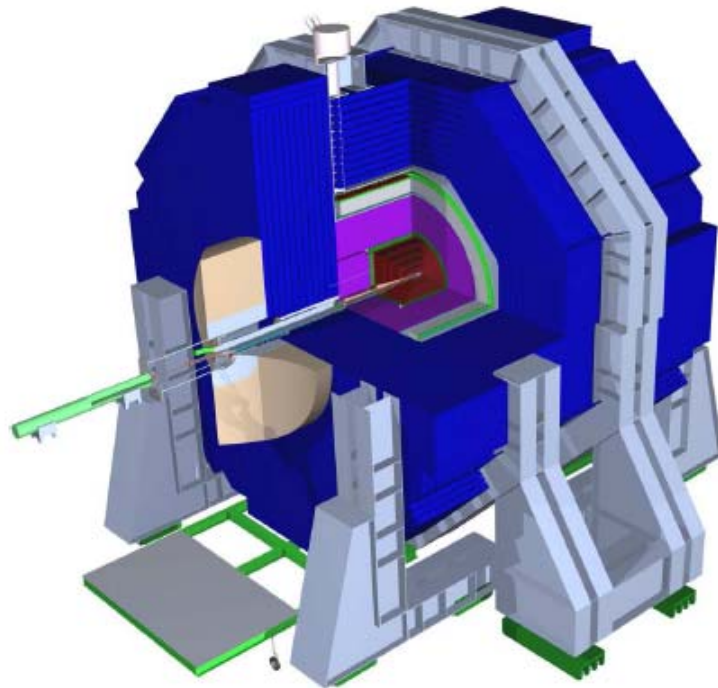
The group

R&D plan

Conclusion

SiD Letter of Intent

31 March 2009



2009/4/17

TILC09 S.Yamada

The SiD group

Location of LOI and supporting documents

<http://silicondetector.org/display/SiD/LOI>

Introduction

Subsystem

MDI and global issues

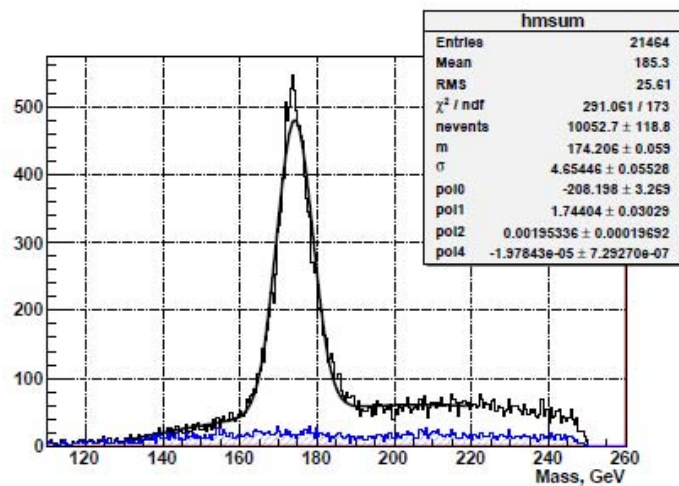
Physics performance and

Benchmarking

Cost estimate

SiD R&D

Letter of Intent from the
Fourth Detector ("4th") Collaboration at the
International Linear Collider



t quark mass reconstructed with standard model backgrounds.

The 4th group

The LOI location

<http://www.4thconcept.org/4LoI.pdf>

Supporting documents

<http://www.4thconcept.org>

Introduction

Description of the detector

The performance of the detector

Physics Studies of the

Benchmark processes

MDI

Status of realistic detector

model and R&D

Structure and capability

LOIs continued

- They contain much information for IDAG to study for validation.
- While the length was limited by ILCSC,
all groups overrun the given limit to some extent.
(We agreed on certain excesses.)
- The groups provided more detailed information with support documents.
These are also available from their web pages.

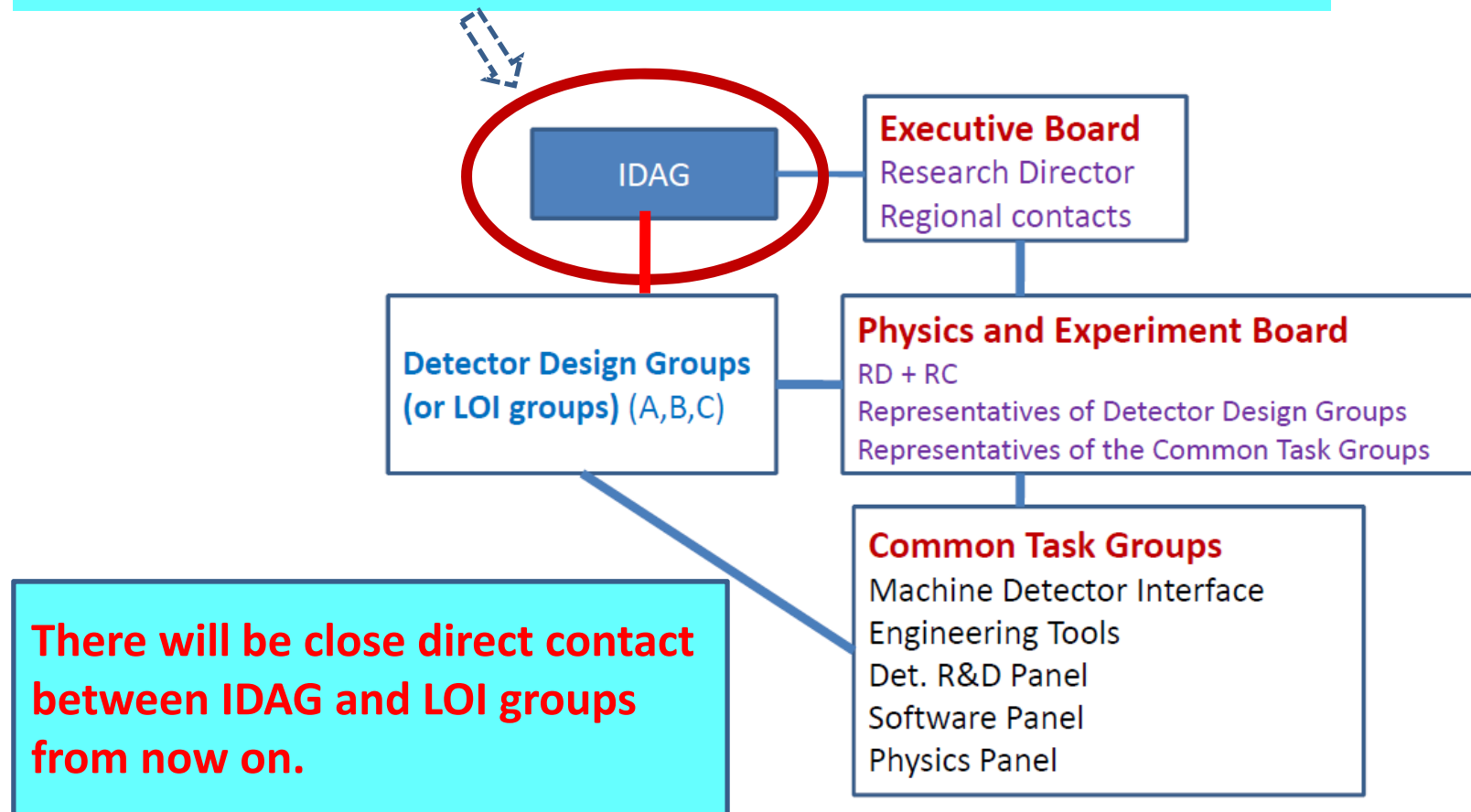
They reflect tremendous amount of work carried out by the groups in preparing for the LOIs.

- Many authors signed the LOI. They included many university people.

ILD (148 Inst.), SiD(77 Inst.), the 4th(32 Inst.)

- It is encouraging and important in the view that ILC will be a research facility for yet-young students.
- Also there will be many topics for universities to study regarding R&D for detector technologies and physics simulations.

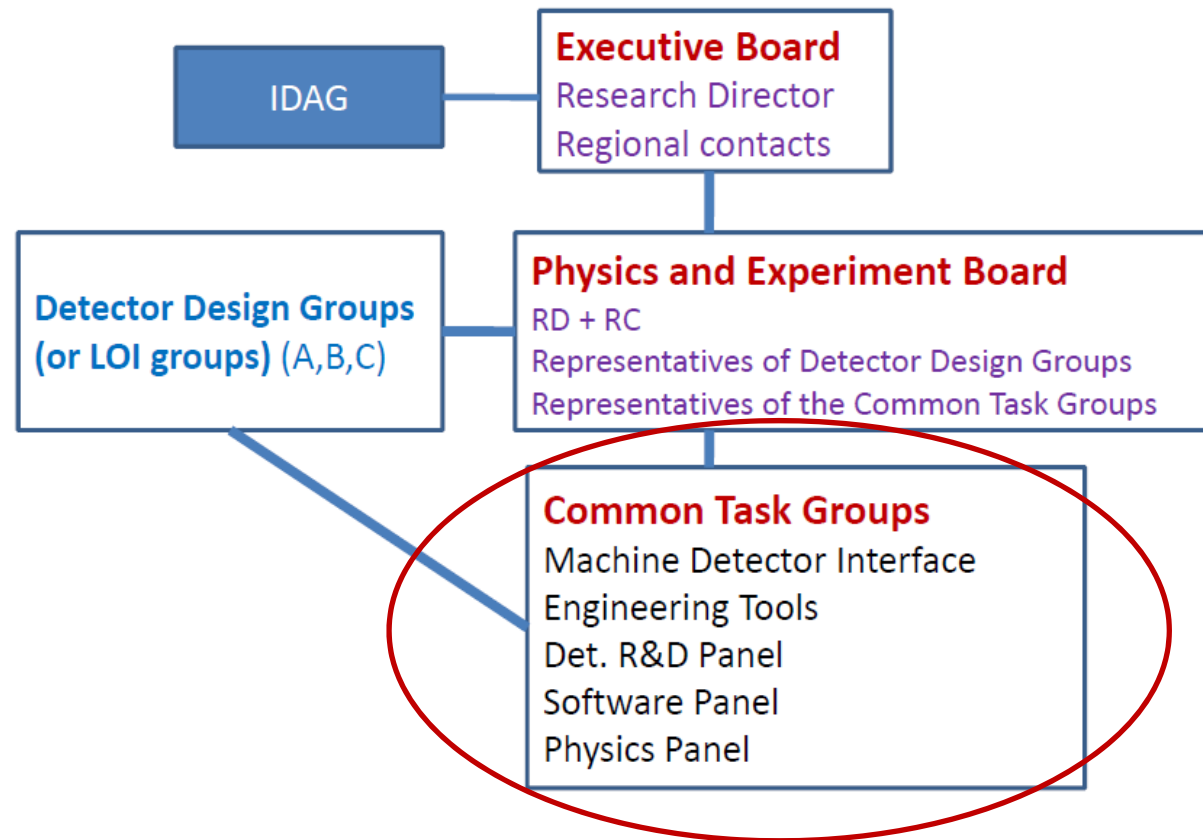
IDAG received the submitted LOIs.
It has started the validation procedure
first by looking into them and listing
questions.



**There will be close direct contact
between IDAG and LOI groups
from now on.**

IDAG

- **IDAG organized itself in Chicago to be ready for the validation process, as was reported by its Chair at LCWS08.**
 1. Each member will examine one of the three LOIs and also one of the four categories (Tracking, CAL, MDI, Benchmarks) through all the LOIs.
 2. IDAG listed more questions to be answered in LOIs.
- **IDAG had internal meetings after LCWS08 to become ready for LOIs.**
- **IDAG will listen to presentations this afternoon and interview each group tomorrow.**
- **There will be an IDAG-proper meeting on June 22/23 in Paris.**
- I expect and request IDAG to give a validation report at **the ALCPG meeting in New Mexico, during Sep.29-Oct.3, this Autumn.**



The activity of each **common task group** is reported monthly at the physics and experiment board meeting. The minutes of the past meetings include these reports.

There will be also presentations on their activities in the plenary session.

Machine Detector Interface

- This group was active since one year to communicate with BDS group of GDE. They had several meetings.
- **Recently, the minimum requirement document was finalized which was agreed by all the LOI groups in making their LOIs. This process required long time.**
- Requested by the LOI groups, MDI group contacted the group of beam monitoring experts to produce a document which was referred by all the groups in their LOIs.

The expert group reacted quickly to combine their works into a common report.

- **There will be a presentation by Karsten Buesser on MDI during this workshop on 19.**

Engineering Tools

- The aim of this group is to find a common design tool with the accelerator group for the detectors which will become necessary in the future when drawings are exchanged.
- Catherine Clerc contacts with relevant GDE members, particularly BDS members and also MDI members to seek a way. Now different labs use different tools and it seems realistic to find a interface between different tools.
- Works will continue.

Detector R&D

- **This group will play critical roles in the LOI process.**
- There are members representing major R&D collaborations.
- They met first in Chicago and discussed the role and program of the group.

the aim: to nurture R&D in and across the concept groups

The plan is to make progresses step by step.

- They identify the R&D activities in a matrix:
 - vertically along the LOI groups
 - and horizontally along the R&D collaborations.
- The group will facilitate communication between LOI groups and R&D collaborations.
- **Report of the group will be made by Marcel Demarteau on 20.**

Software Panel

- **Intensive communication between LOI groups regarding the benchmark reactions for the LOIs**

1. Common conditions for simulations, beam polarization, background conditions, luminosity
2. Common event generator/data sample

- **Cooperation for the simulation at CLIC energies.**

This was done more on the base of concept group than the software panel, and was useful for the group to verify their approach at higher energies.

Now, since LOIs are finished, the group can spend more time for a new activity. There will be a discussion with CLIC people during this meeting for the future cooperation.

Report in the plenary session by Norman Graf on 20.

Physics Panel

- The group will think about possible physics scenarios for ILC.
 - The group has more members invited from a wider community.
 - They met first in Chicago and worked out their first program.
- how the case for the ILC can be made after about one year worth of LHC data.
- Write briefing papers on each based on literature
 - Light SUSY
 - Gauge Mediated SUSU Boson scenarios, quasi stable staus, easy to see
 - Z' at 2TeV seen in mu pairs
 - 1 TeV resonance decaying into 2 tops
 - 200 GeV Higgs seen in $H \rightarrow ZZ$
 - black holes with 3TeV mass, of 100 microbarn cross section
 - Study of Gamma-Gamma physics case as was requested by ILCSC October 2008.
 - This was prepared by the convener with some gamma-gamma experts and combined with the GDE's report by February 2009.
 - There was not enough time for the entire panel to work on the draft and the report was presented as an experts report.
 - **(Tim Barklow will present the study on 18)**
 - This triggered the panel to study more systematically possible staging scenario assuming a low mass Higgs particle.
 - **Keisuke Fujii will present the activity of the panel on 18**

Cooperation with CLIC

- So far cooperation was made by the concept groups separately through the contact persons.
- Simulations of the performance of ILC detector concepts at CLIC energies were made by ILD and SiD.
- The results were not reported officially but said to have shown good performance.
- Software Panel will continue these works
- There were also cooperation in hardware.

How we proceed from here

- The validated concepts are expected to complete their technical design in 2012 and to demonstrate the physics possibility at ILC.
- LOI groups will continue R&D activities according to their priority list given in the LOI and also will refine their simulation for physics.
- Detector components should be chosen.
- Feasibility for construction and desired performance should be shown, including the questions of Push-Pull.
- MDI issues need to be detailed with GDE/BDS group.
- In these procedure works of common interest can be carried by the common task groups.
- There will be an interim report in 2010, and in a written form as required by ILCSC/PAC.
- We hope many critical R&Ds be finished by this checking point.
- IDAG will keep watching the progress of the validated groups through the entire period in view of this plan and the LOIs .

Conclusion

- The detector activity scheme is fully working.
- A big step was the submission of the all three LOIs by the concept groups.
- IDAG started investigation the documents.
- The five common task groups are working on each task.
- The validated concept groups will continue their R&Ds and physics studies to be included in the proposal in 2012.
- There will be a written interim report in 2010.