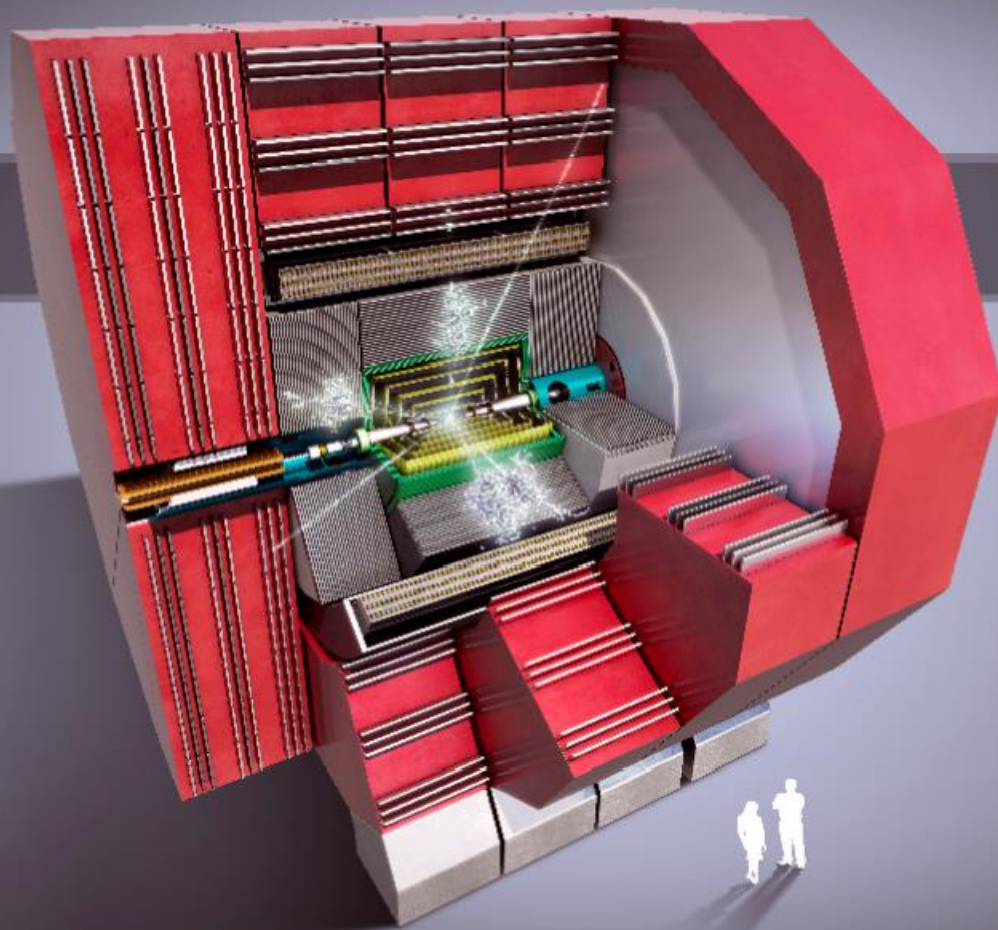


# CLIC detector & physics study

-- *Intro and general news* --



 Detector

- Detector model
- CLIC & Snowmass
- Organisation news
- Upcoming meetings
- Practical details

Spokesperson election =>  
Thank you for your overwhelming support !!!

My door is open.  
Please convey your suggestions



# The CLIC detector model.....



# CLIC detector model optimisation



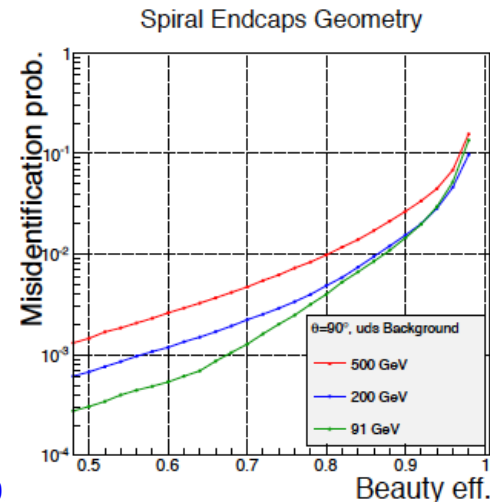
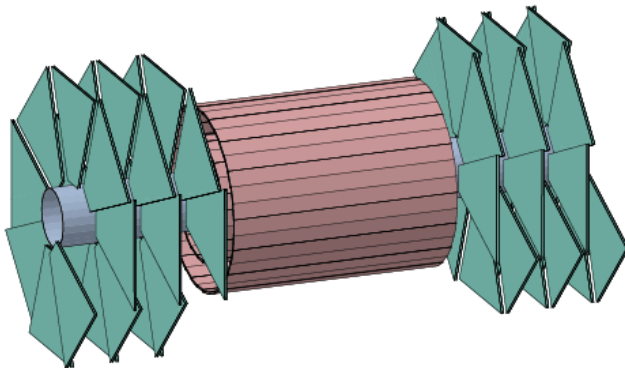
The current CLIC\_SiD and CLIC-ILD detector models were frozen end-2010. With our current understanding, complemented with additional simulation studies, we plan to come to:

- **An optimised CLIC detector model by end 2014**
- Implemented in **DD4HEP geometry** software

In this context several studies are ongoing, and more help is welcome ★:

## Vertex detector optimisation:

- Vertex detector geometry optimisation (#material, single/double layers, spiraling disks, etc.) => optimise for flavour tagging
- See Vertex WG <http://indico.cern.ch/categoryDisplay.py?categId=2843>



# CLIC detector model optimisation



## (forward) tracking optimisation ★:

- Study of high-occupancy region
- Overall tracker optimisation (e.g. radius, aspect ratio, design)

## ECAL optimisation:

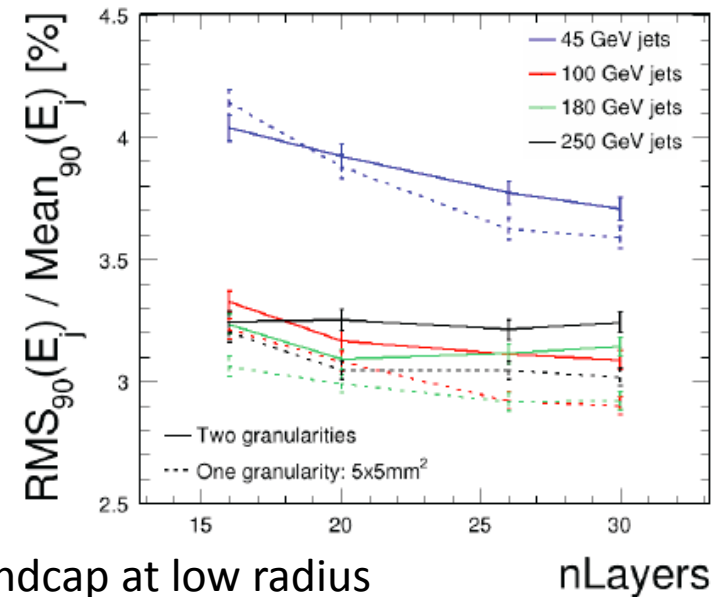
- Broad study of ECAL layout and PFA performance => Quite advanced
- Dedicated ILC/CLIC WG:
- <http://indico.cern.ch/categoryDisplay.py?categId=4379>

## Forward region optimisation ★:

- Understand/tackle high occupancies in calorimeter endcap at low radius
- Understand penalties vs. benefits for QD0 inside/outside the detector

## DD4hep geometry description software package ★:

- Development and implementation



# CLICdp and the Snowmass process.....



**SNOWMASS** CSS 2013  
**ON THE MISSISSIPPI**  
 JULY 29 - AUGUST 6, 2013

ORGANIZED BY THE DIVISION OF PARTICLES AND FIELDS OF THE APS  
 HOSTED BY THE UNIVERSITY OF MINNESOTA

**STUDY GROUPS**

- Energy Frontier
- Chip Block (Michigan State)
- Michael Smith (USAC)
- Inensity Frontier
- Juan Luis Alvarez (SLAC)
- Harry Thomas (Argonne)
- Control Frontier
- Jonathan Feng (University of California, Irvine)
- Steve Ritz (University of California, Santa Cruz)
- Frontier Capabilities
- William Rucklidge (MIT)
- Musick Elk-Hansen (LBNL)
- Non-Standard Model Frontier
- Marcelo Drees (Argonne)
- Howard Schultz (MIT, Hopkins)
- Ron Lipton (Fermilab)
- Computing Frontier
- Lothar Baumick (Fermilab)
- David Barkin (Fermilab)
- Education and Outreach
- Nancy Bosworth (Fermilab)
- Dan Combs (Minnesota)
- Theory Panel
- Michael Dine (University of California, Santa Cruz)

**LOCAL ORGANIZING COMMITTEE**

- Marcelo Drees (Fermilab and University of Chicago)
- Dan Combs (Minnesota, Chair)
- Prakash Ludhans (Minnesota)
- Lisa Everett (Wisconsin)
- Alan Hahn (Minnesota, Co-Chair)
- Ron Heller (Minnesota)
- Judy Kaplan (Minnesota)
- Travis Kubota (Minnesota)
- Jeremy Mann (Minnesota)
- Bridget McKay (Minnesota)
- Marvin Marbach (Minnesota)
- Dark Matter (Minnesota)
- Ruth Dine (Minnesota)
- Gregory Perdue (Minnesota)
- Ron Pieling (Minnesota)
- Marta Plehn (Minnesota)
- Yongchun Qian (Minnesota)
- Walter Riegler (Minnesota)
- Wesley Smith (Wisconsin)

**DPE EXECUTIVE COMMITTEE**

- Chair: Jonathan Rosner (University of Chicago)
- Chair-Elect: Ian Shipsey (Purdue University)
- Vice Chair: Jik-Nyeon Seung (University of Maryland, College Park)
- Past Chair: Pierre Ranveaux (University of Florida, Gainesville)
- Secretary/Treasurer: Howard Haber (University of California, Santa Cruz)
- Executive: Stephen Casper (Purdue University)

**Members at Large:**

- Jonathan Feng (University of California, Irvine)
- Lynne Di (University of Rochester)
- Earl Gardner (Purdue University)
- Nikolaus Fiaschi (University of Illinois, Chicago)
- Robert Bernabetti (Fermilab)
- Sally Seidel (University of New Mexico)

APS  
 UNIVERSITY OF MINNESOTA

WWW.SNOWMASS2013.ORG

PHOTOGRAPHS BY  
 EATERSHLOW

# CLICdp and Snowmass



CLICdp participated in:

- Two **Energy Frontier** meetings (at BNL and Seattle) => 7 CLICdp talks
- The **community meeting in Minneapolis**

CLICdp input to Snowmass:

***Physics at the CLIC e+e- Linear Collider, Input to the Snowmass process 2013***

<http://arxiv.org/abs/1307.5288>

Final update on arXiv (v3) was submitted yesterday

CLICdp is well represented in the summary papers of:

- The Higgs working group
- The top working group
- The electroweak working group

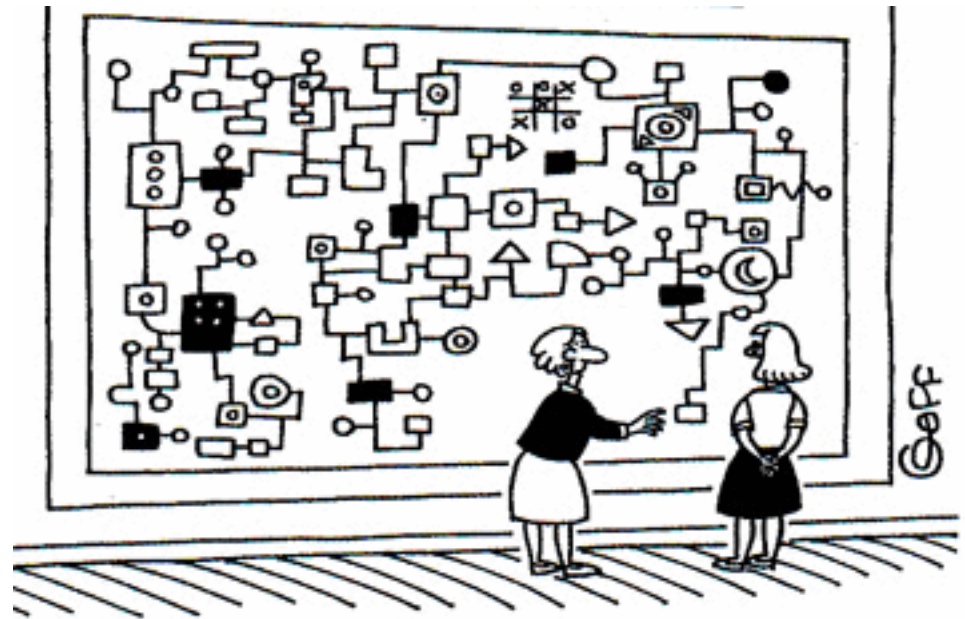
While it is a struggle to get represented in an objective way in the report of

- The BSM working group

Overall satisfied with our participation in the Snowmass process

=> Collected new ideas for future CLIC physics studies (listed in white paper)

# Some news on the organisation.....





# CLICdp organisation news



**LAPP Annecy signed the MoC**

⇒ **CLICdp now has 18 institutes**

<http://lcd.web.cern.ch/LCD/Home/MoC.html>

\*\*\*\*

Next Institute Board meeting today

Will hopefully proceed to appoint (with approval of the IB):

- **Chair for the Publication Committee**
- **Chair of the Speakers Committee**

\*\*\*\*

Then continue to **implement** further elements of the **organisational structure**, with corresponding **MoC Annex 3 text** and nominations.

# CLICdp publications



**CLICdp procedures for conferences and publications** approved at IB on 11/6/2013

See presentation by Aharon Levy:

<http://indico.cern.ch/conferenceDisplay.py?confId=260713>=> Currently

The **CLICdp notes series are available in CDS since a few days:**

CLIC-DP-Pub-yyyy-nnn (*following internal review*)

CLIC-DP-Note-yyyy-nnn (*following internal review*)

CLIC-DP-Conf-yyyy-nnn (*following internal review*)

CLIC-DP-Int-yyyy-nnn (*without review*)

CLIC-DP-Draft-yyyy-nnn <= *only used for reviewing procedure*

Submission of CLIC-DP-..... In CDS can start.

(As a result the LCD-Note-yyyy-nnn will be used much less)

PhD, Master thesis can be submitted through CERN-THESIS-yyyy-nnn

Use experiment identifier “CLICdp” in CDS

All submissions by: [clicdp-pubcom@cern.ch](mailto:clicdp-pubcom@cern.ch)

Reviewing procedure accessible to: [clicdp-members@cern.ch](mailto:clicdp-members@cern.ch)

*See backup slides for more details and links*

# Upcoming meetings .....



# Upcoming meetings



**FCAL** workshop, DESY Zeuthen, October 7+8

<https://indico.desy.de/conferenceDisplay.py?ovw=True&confId=8669>

**SiD** workshop, SLAC, October 14-16

<https://ilcagenda.linearcollider.org/conferenceDisplay.py?confId=6161>

**LCWS13**, Tokyo Univ., November 11-15

<http://www.icepp.s.u-tokyo.ac.jp/lcws13/>

Plenary talk on CLICdp by Andre Sailer

Information on CLICdp talks is being collected by:

Philipp Roloff / Mark Thomson for physics analysis talks

Michael Hauschild for all other talks

**Next CLIC workshop, February 3-7 2014 at CERN**

<https://indico.cern.ch/internalPage.py?pageId=1&confId=275412>

To be discussed at the IB meeting:

limit the Detector&Physics part to (first) 3 days ?

# Practical details for this meeting .....



# Practicalities



- Meeting is spread over **many different meeting rooms** ! Sorry
- **Coffee** served in building 40 for the following breaks:
  - Today, after the plenary session
  - Tomorrow, before the plenary session
- Possibility to **visit** CLIC two-beam module and CLIC showroom (incl. detector mock-up)
  - Organisation: Sophie Redford
  - Today, 18 hrs at building 2008
- Contribution to the dinner, 60 CHF, centrally collected
- **Dinner**: tonight, appointment at **Café de l'Aviation, 19:30 hrs**
  - Tram stop Blandonnet
- **Photograph**: tomorrow 10 min before plenary session (afternoon, bldg 40)

# THANK YOU !



# More on CLIC-DP... notes



## Submissions

- Draft submission for Pub, Note and Conf (by clicdp-pubcom@cern.ch):
  - CLIC-DP-Draft-yyyy-nnn: <https://cds.cern.ch/submit?doctype=GENSBM>
  - Drafts can be read and commented including comment file upload (by clicdp-members@cern.ch)
- Submission of approved Pub, Note and Conf (by clicdp-pubcom@cern.ch):
  - Manual creation of new records, comments stay in the draft
  - CLIC-DP-Pub-yyyy-nnn: <https://cds.cern.ch/submit?doctype=GENSBM>
  - CLIC-DP-Note-yyyy-nnn: <https://cds.cern.ch/submit?doctype=GENSBM>
  - CLIC-DP-Conf-yyyy-nnn: <https://cds.cern.ch/submit?doctype=GENSBM>
- Submission of thesis (by clicdp-pubcom@cern.ch, internal enforcement necessary as this submission can be used by all CERN accounts):
  - CERN-THESIS-yyyy-nnn: <https://cds.cern.ch/submit?doctype=CTH>
- Submission of Int (by clicdp-pubcom@cern.ch):
  - CLIC-DP-Int-yyyy-nnn: <https://cds.cern.ch/submit?doctype=GENSBM>



# More on CLIC-DP... notes



## Collections

- Approved records will belong to:
  - CLIC-DP-Pub-yyyy-nnn: <https://cds.cern.ch/collection/Preprints>
  - CLIC-DP-Note-yyyy-nnn: <https://cds.cern.ch/collection/CERN%20Internal%20Notes>
    - Subcollection “CLIC Detector and Physics Study Notes” which contains Notes:
      - + Focus on “CLIC Detector and Physics Study Internal Notes” for Int, restricted to clicdp-members@cern.ch
  - CLIC-DP-Conf-yyyy-nnn: <https://cds.cern.ch/collection/Preprints>
  - CERN-THESIS-yyyy-nnn: <https://cds.cern.ch/collection/Theses> + CLIC-DP metadata
- “CLIC Detector and Physics Study” main collection that includes all approved CLIC-DP-\* records and CLIC-DP-related theses
  - + Focus on “CLIC Detector and Physics Study Drafts” which contains drafts, restricted to clicdp-members@cern.ch
- <https://cds.cern.ch/collection/CERN%20R%26D%20Projects> as initial position (Q1 for final)

# Ongoing activities: hardware R&D



Ongoing activities “with direct link to CLIC study”:

- **Forward region calorimetry** => FCAL activities
  - Incl. effort on improved Bhabha scattering simulation
- **CLIC vertex detector R&D (+ inner tracking integration)**
  - Hybrid option activities ongoing: Electronics design, pulsed power, engineering aspects, tests, physics performance
  - Other technology option ?
- **Forward tracker**
  - Forward tracker design and hardware studies (linked to vertex studies)
- **ECAL/HCAL**
  - CALICE ECAL (including new ECAL optimisation studies)
  - CALICE HCAL
    - Ongoing analysis of tungsten HCAL beam tests (AHCAL+DHCAL)
- **General engineering studies**
  - Engineering, etc. Working Group
- **Coil R&D**
  - Design studies + reinforced conductor R&D
  - Dedicated meeting within engineering WG