

CLICdp news

-- CLICdp 2-day meeting June 10th 2014--



list of contents



- Update on CLICdp collaboration
- Update on organisation
- Current progress of the working groups
- Update on possible reviewing in European Strategy context
- Test beams at CERN in 2014

- LCWS14 announcement

- Practical details of the meeting



update on CLICdp institutes

Australia	Australian Collaboration for Accelerator Science (ACAS), University of Melbourne
Belarus	National Scientific and Educational Centre of Particle and High Energy Physics (NC-PHEP), Belarusian State University, Minsk
Chile	<u>Pontificia Universidad Católica de Chile</u> , Santiago
Czech Republic	Institute of Physics of the Academy of Sciences of the Czech Republic, Prague
Denmark	Department of Physics and Astronomy, Aarhus University
France	Laboratoire d'Annecy-le-Vieux de Physique des Particules (LAPP), Annecy
Germany	Max-Planck-Institut für Physik, Munich
Israel	Department of Physics, Faculty of Exact Sciences, Tel Aviv University
Norway	Department of Physics and Technology, University of Bergen
Poland	The <u>Henryk Niewodniczanski</u> Institute of Nuclear Physics, Polish Academy of Sciences, Cracow
Poland	Faculty of Physics and Applied Computer Science, <u>AGH</u> University of Science and Technology, Cracow
Romania	Institute of Space Science, Bucharest- <u>Magurele</u>
Serbia	<u>Vinca</u> Institute for Nuclear Sciences, Belgrade
Spain	Spanish Network for Future Linear Colliders
Switzerland	CERN
United Kingdom	The School of Physics and Astronomy, University of Birmingham
United Kingdom	University of Bristol
United Kingdom	University of Cambridge
United Kingdom	University of Glasgow
United Kingdom	The Department of Physics of the University of Liverpool
United Kingdom	Oxford University
USA	Argonne National Laboratory, High Energy Physics Division
USA	University of Michigan, Physics Department

<http://clicdp.web.cern.ch/content/participating-institutes>

CLICdp now: 23 institutes

the full MoC text, including recent annexes:

<http://clicdp.web.cern.ch/content/collaboration>



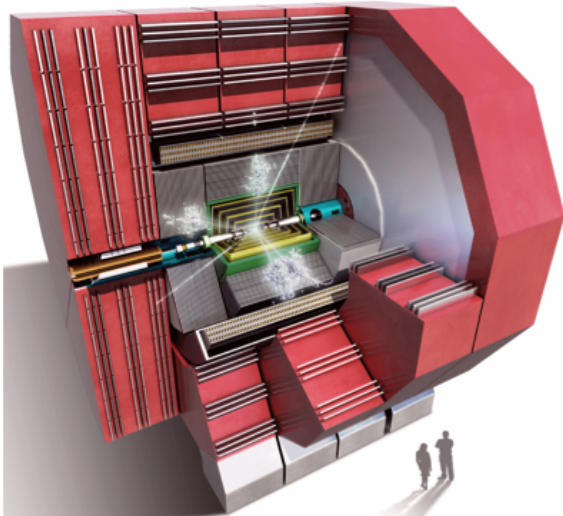


CLICdp

CLIC detector and physics study

- HOME
- COLLABORATION
- ORGANISATION
- DOCUMENTS & PUBLICATIONS
- OUTREACH
- USEFUL LINKS
- GALLERIES

Welcome to CLICdp

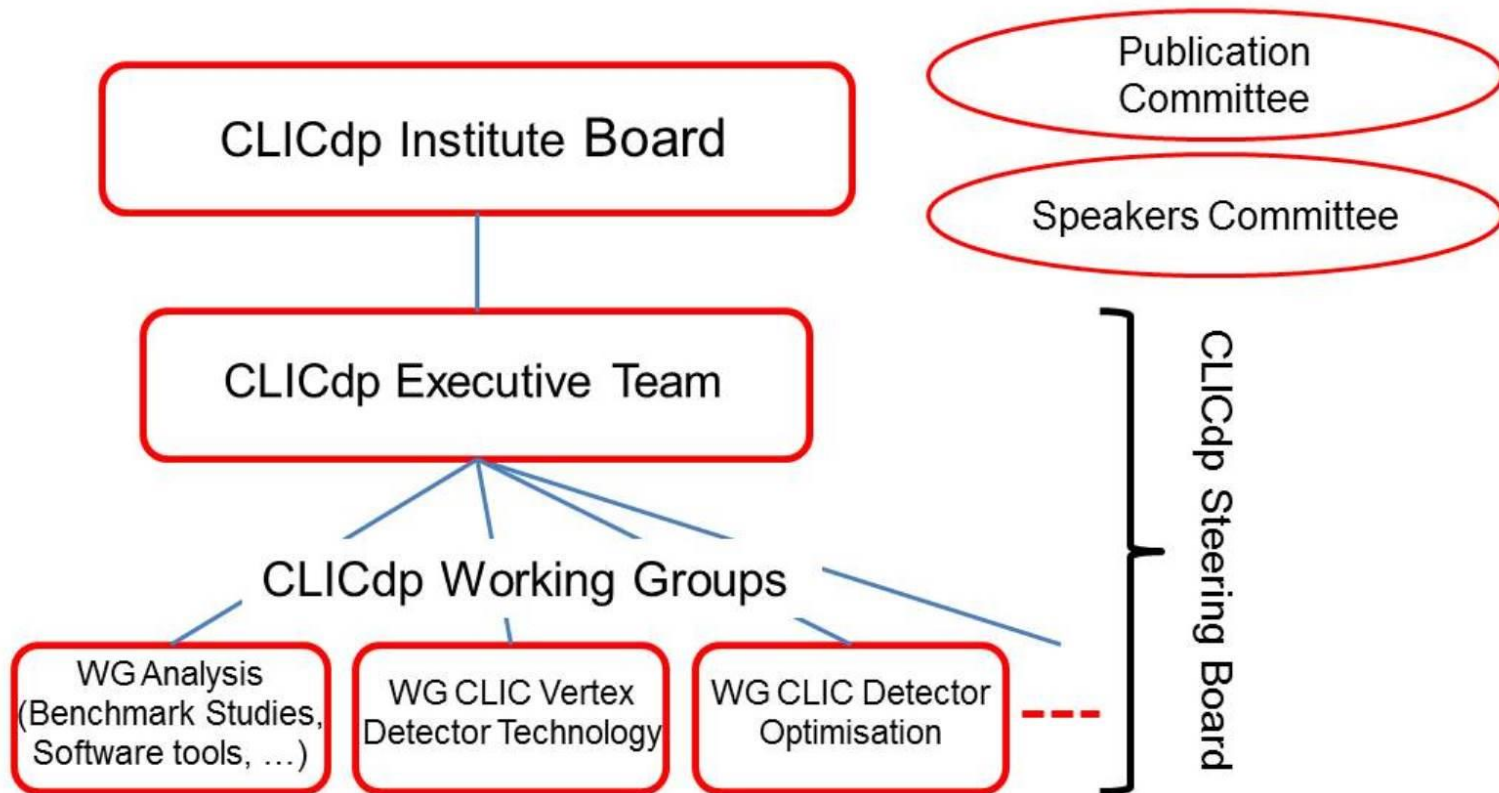


CLICdp, the CLIC detector and physics study, is an international collaboration presently composed of 22 institutions. The collaboration is addressing detector and physics issues for the future Compact Linear Collider (CLIC), a high-energy electron-positron accelerator which is one of the options for the next collider to be built at CERN. Precision physics under challenging beam and background conditions is the key theme for the CLIC detector studies. This leads to a number of cutting-edge R&D activities within CLICdp.

Our new web page is up and running !
Many thanks to Olena, Konrad, Sophie, Thibault
Suggestions and additional contributions welcome
clicdp-webmaster@cern.ch



CLICdp organisation



Roles



Institute board:

Frank Simon (chair) +1 representative per Institute

Executive team:

LL (spokesperson), Konrad Elsener (technical coordinator), Mark Thomson, James Wells

Working group conveners:

Analysis (incl. benchmark studies, sw tools, polarisation)

Philipp Roloff, Mark Thomson

Vertex Detector Technology

Dominik Dannheim

Detector Optimisation

Christian Grefe, Frank Simon

Publication committee

Aharon Levy (chair), Philip Burrows, Dieter Schlatter, Ulrik Uggerhoj

Speakers Committee

Ivanka Bozovic-Jelisavcic (chair), Max Chefdeville, Eva Sicking

CLICdp representatives in LCC structure

Mark Thomson => representing CLICdp in LCC detector/physics executive board (LCCPDeb)

Andre Sailer => representing CLICdp in LCC software working group

Recent progress

Analysis working group

See presentations at this meeting !

- Good progress with several Higgs benchmark studies
- Analysis updates presented at AWLC14
- Improved combined Higgs fit results (mostly thanks to HZ with $Z \rightarrow qq$)
- Some analysis notes exist, others in preparation
- A few analyses still to be finished, before completing the CLIC Higgs paper
- Ready to start a new set of benchmark analyses => *looking for volunteers*

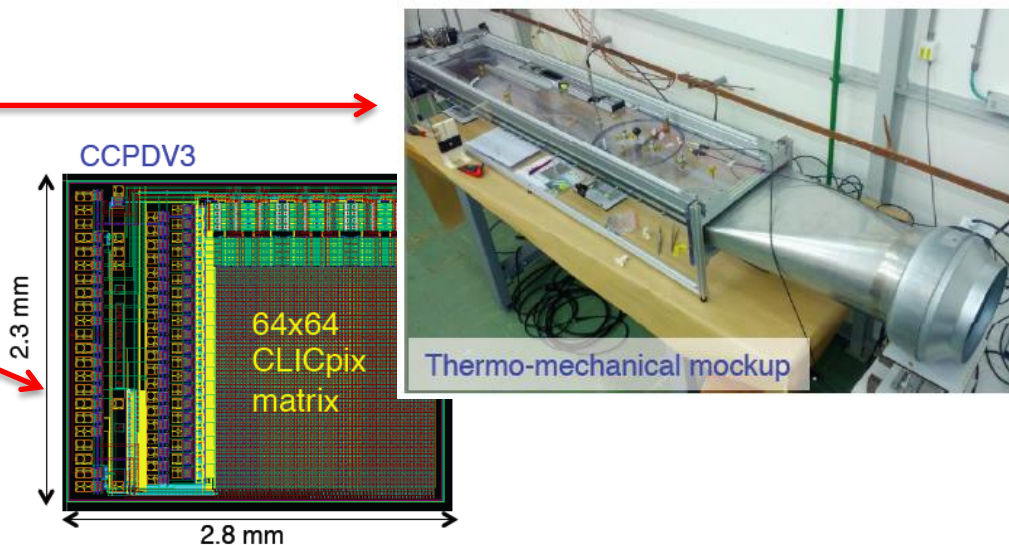
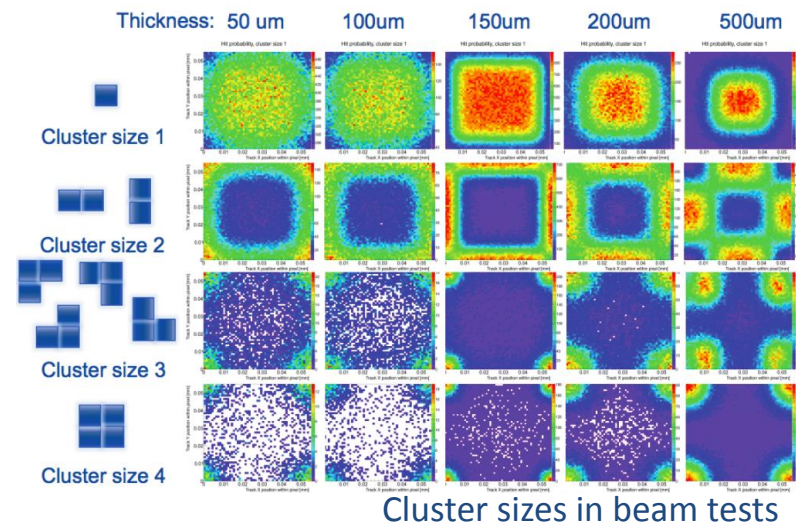
Channel	Measurement	Observable	Statistical precision		
			350 GeV 500 fb ⁻¹	1.4 TeV 1.5 ab ⁻¹	3.0 TeV 2.0 ab ⁻¹
ZH	Recoil mass distribution	m_H	120 MeV	—	—
ZH	$\sigma(HZ) \times BR(H \rightarrow \text{invisible})$	Γ_{inv}	0.6%	—	—
ZH	$H \rightarrow b\bar{b}$ mass distribution	m_H	tbd	—	—
$H\nu_e\bar{\nu}_e$	$H \rightarrow b\bar{b}$ mass distribution	m_H	—	40 MeV*	33 MeV*
ZH	$\sigma(HZ) \times BR(Z \rightarrow \ell^+\ell^-)$	g_{HZ}^2	4.2%	—	—
ZH	$\sigma(HZ) \times BR(Z \rightarrow q\bar{q})$	g_{HZ}^2	1.8%	—	—
ZH	$\sigma(HZ) \times BR(H \rightarrow b\bar{b})$	$g_{HZ}^2 g_{Hbb}^2 / \Gamma_H$	1% [†]	—	—
ZH	$\sigma(HZ) \times BR(H \rightarrow c\bar{c})$	$g_{HZ}^2 g_{Hcc}^2 / \Gamma_H$	5% [†]	—	—
ZH	$\sigma(HZ) \times BR(H \rightarrow gg)$	g_{HZ}^2	6% [†]	—	—
ZH	$\sigma(HZ) \times BR(H \rightarrow \tau^+\tau^-)$	$g_{HZ}^2 g_{H\tau\tau}^2 / \Gamma_H$	5.7%	—	—
ZH	$\sigma(HZ) \times BR(H \rightarrow WW^*)$	$g_{HZ}^2 g_{HWW}^2 / \Gamma_H$	2% [†]	—	—
ZH	$\sigma(HZ) \times BR(H \rightarrow ZZ^*)$	$g_{HZ}^2 g_{HZZ}^2 / \Gamma_H$	tbd	—	—
$H\nu_e\bar{\nu}_e$	$\sigma(H\nu_e\bar{\nu}_e) \times BR(H \rightarrow b\bar{b})$	$g_{HWW}^2 g_{Hbb}^2 / \Gamma_H$	3% [†]	0.3%	0.2%
$H\nu_e\bar{\nu}_e$	$\sigma(H\nu_e\bar{\nu}_e) \times BR(H \rightarrow c\bar{c})$	$g_{HWW}^2 g_{Hcc}^2 / \Gamma_H$	—	2.9%	2.7%
$H\nu_e\bar{\nu}_e$	$\sigma(H\nu_e\bar{\nu}_e) \times BR(H \rightarrow gg)$	g_{HWW}^2	—	1.8%	1.8%
$H\nu_e\bar{\nu}_e$	$\sigma(H\nu_e\bar{\nu}_e) \times BR(H \rightarrow \tau^+\tau^-)$	$g_{HWW}^2 g_{H\tau\tau}^2 / \Gamma_H$	—	3.7%*	tbd
$H\nu_e\bar{\nu}_e$	$\sigma(H\nu_e\bar{\nu}_e) \times BR(H \rightarrow \mu^+\mu^-)$	$g_{HWW}^2 g_{H\mu\mu}^2 / \Gamma_H$	—	38%	16%
$H\nu_e\bar{\nu}_e$	$\sigma(H\nu_e\bar{\nu}_e) \times BR(H \rightarrow \gamma\gamma)$	g_{HWW}^2	—	15%	tbd
$H\nu_e\bar{\nu}_e$	$\sigma(H\nu_e\bar{\nu}_e) \times BR(H \rightarrow Z\gamma)$	g_{HWW}^2	—	42%	tbd
$H\nu_e\bar{\nu}_e$	$\sigma(H\nu_e\bar{\nu}_e) \times BR(H \rightarrow WW^*)$	g_{HWW}^4 / Γ_H	tbd	1.1%*	0.8%*
$H\nu_e\bar{\nu}_e$	$\sigma(H\nu_e\bar{\nu}_e) \times BR(H \rightarrow ZZ^*)$	$g_{HWW}^2 g_{HZZ}^2 / \Gamma_H$	—	3% [†]	2% [†]
He^+e^-	$\sigma(He^+e^-) \times BR(H \rightarrow b\bar{b})$	$g_{HZ}^2 g_{Hbb}^2 / \Gamma_H$	—	1% [†]	0.7% [†]
$t\bar{t}H$	$\sigma(t\bar{t}H) \times BR(H \rightarrow b\bar{b})$	$g_{Htt}^2 g_{Hbb}^2 / \Gamma_H$	—	8%	tbd
$HH\nu_e\bar{\nu}_e$	$\sigma(HH\nu_e\bar{\nu}_e)$	g_{HHWW}	—	7%*	3%*
$HH\nu_e\bar{\nu}_e$	$\sigma(HH\nu_e\bar{\nu}_e)$	λ	—	32%	16%
$HH\nu_e\bar{\nu}_e$	with -80% e^- polarization	λ	—	24%	12%

Recent progress

Vertex Detector Technology

See presentations at this meeting !

- Two functioning ASICs (for R&D): CLICpix and Timepix3
- Successful beam tests with thin ($\geq 50 \mu\text{m}$) sensors and Timepix chips
- Purchase order for CLICpix-compatible silicon sensor in preparation.
- Low-mass power pulsing scheme tested in laboratory set-up
- Ongoing engineering studies: design, simulations and tests on light supports, air cooling and resulting vibrations
- Functioning active sensor in HV-CMOS for AC coupling to ASICs (coupling tests ongoing)



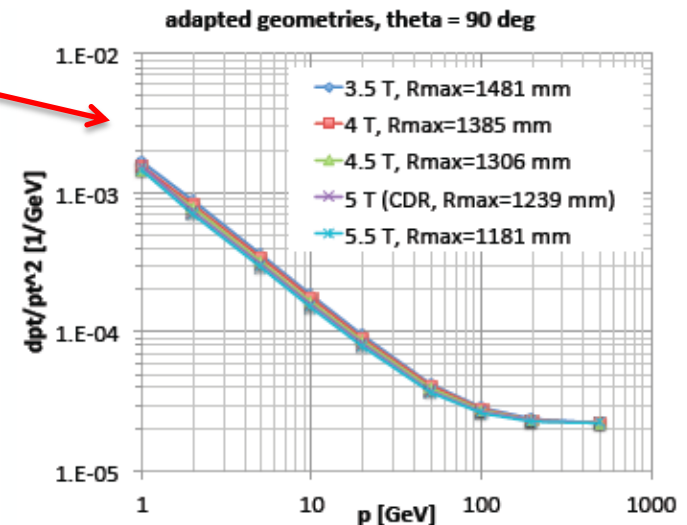
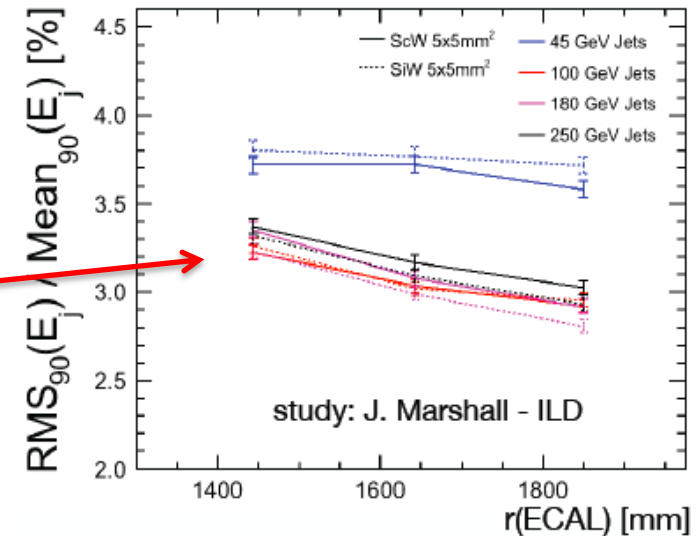
Recent progress

Detector Optimisation

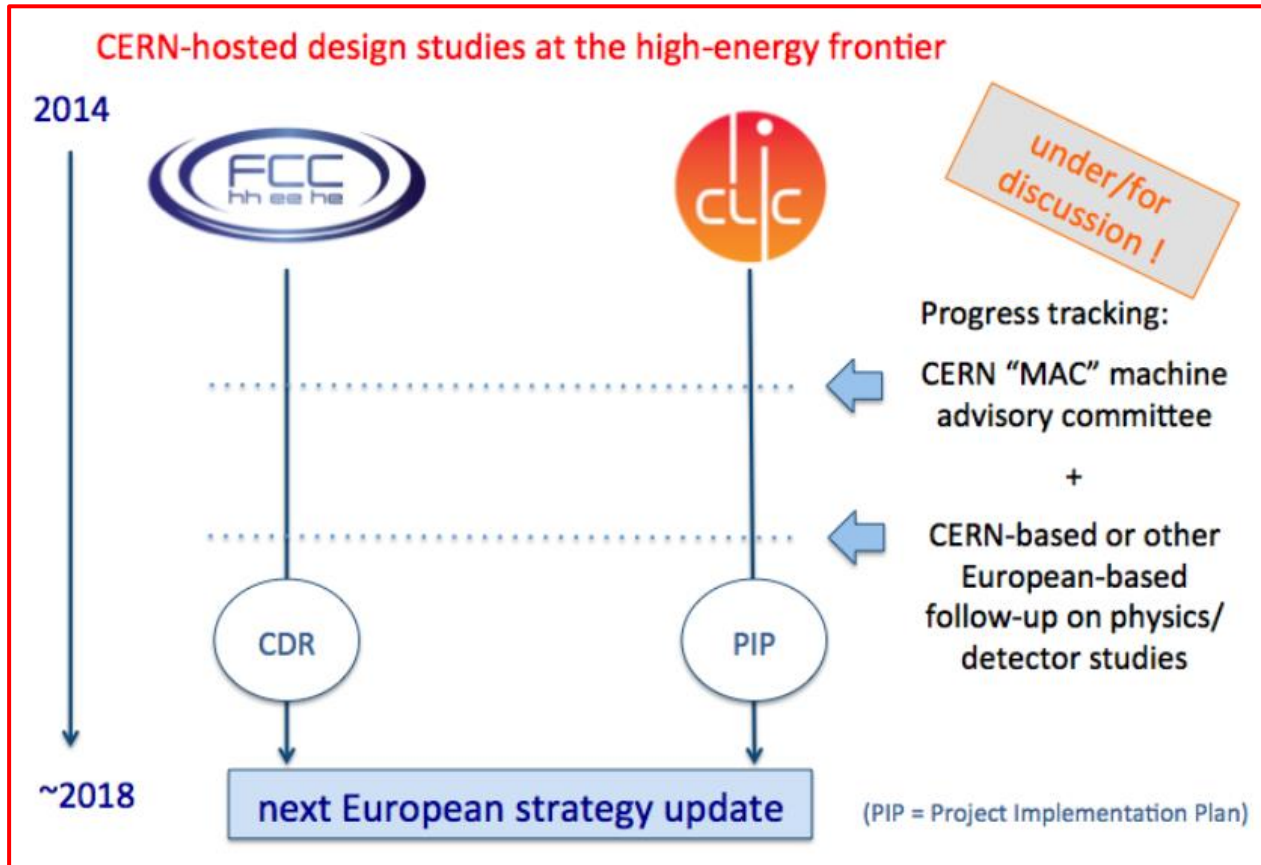
See presentations at this meeting !

New WG since the last meeting => many studies on detector optimisation ongoing

- PFA-based ECAL optimisation, and now also HCAL optimisation
- Vertex detector optimisation for flavour tagging and based on hardware R&D
- Tracking radius and B-field => established a working hypothesis
- Study of reduced end-cap coil size (for QDO out or for longer tracker)
- Shielding study to reduce occupancy in HCAL end cap
-
- Lively and interesting => *more volunteers welcome.*



CLIC and FCC => follow-up



Follow-up reviewing of FCC and CLIC still under discussion:

- For accelerator => "CERN MAC" (was previously called "LHC MAC")
- For physics and detector => new/existing review body still under discussion
- Common FCC/CLIC physics paper probably to be foreseen

CERN test beam schedules 2014



Link to the PS schedules:

<http://sps-schedule.web.cern.ch/sps-schedule/schedules/ps/2014/v100/PSDetailedSchedule.pdf>

Link to the SPS schedules:

<http://sps-schedule.web.cern.ch/sps-schedule/schedules/sps/2014/v100/SPSDetailedSchedule.pdf>

CERN PS, beam T9:

- CLICdp vertex detector
 - Aug 14 – Aug 21
 - Oct 1 – Oct 8
- CALICE AHCAL
 - Oct 8 – Oct 22
 - Nov 26 – Dec 8
- FCAL
 - Oct 22 – Oct 29

CERN SPS, beam H6A:

- CLICdp vertex detector
 - Nov 10 – Nov 17

This meeting



Welcome !

Note the different rooms ! (~7 min walk)

Meeting	Day	Time	Room
Plenary	Tuesday	13:00 – 15:00	6-2-024
Plenary	Wednesday	16:30 – 17:30	6-2-024
Detector optimisation	Tuesday	15:30 – 18:00	6-2-024
Physics, Analysis, SW	Wednesday	09:00 – 12:15	6-2-024
ECAL, HCAL, FCAL R&D	Wednesday	10:00 – 12:15	4-S-030
Vertex, Tracker R&D	Wednesday	14:00 – 16:00	6-2-024
Institute Board	Wednesday	12:15 – 13:45	4-1-007

Webex sessions in room 6-2-024 and 4-1-007:

<https://cern-lcd.webex.com/mw04011/mywebex/default.do?siteurl=cern-lcd>

Vydio in room 4-S-030:

Vydio room connection will be communicated

LCWS14 announcement



<http://lcws14.vinca.rs/welcome/>

October 6-10, Belgrade

Inscription will open soon !



Group photo and dinner

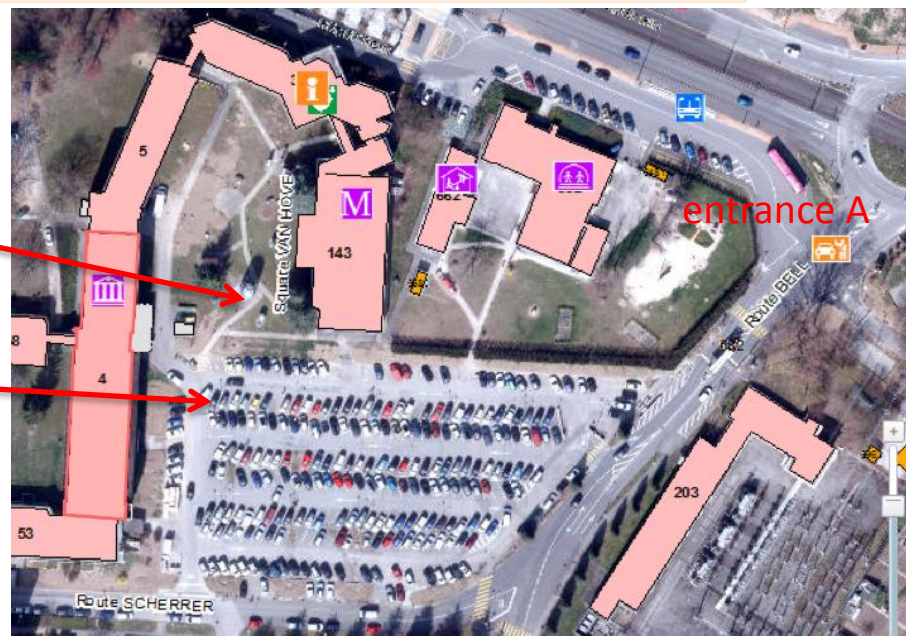


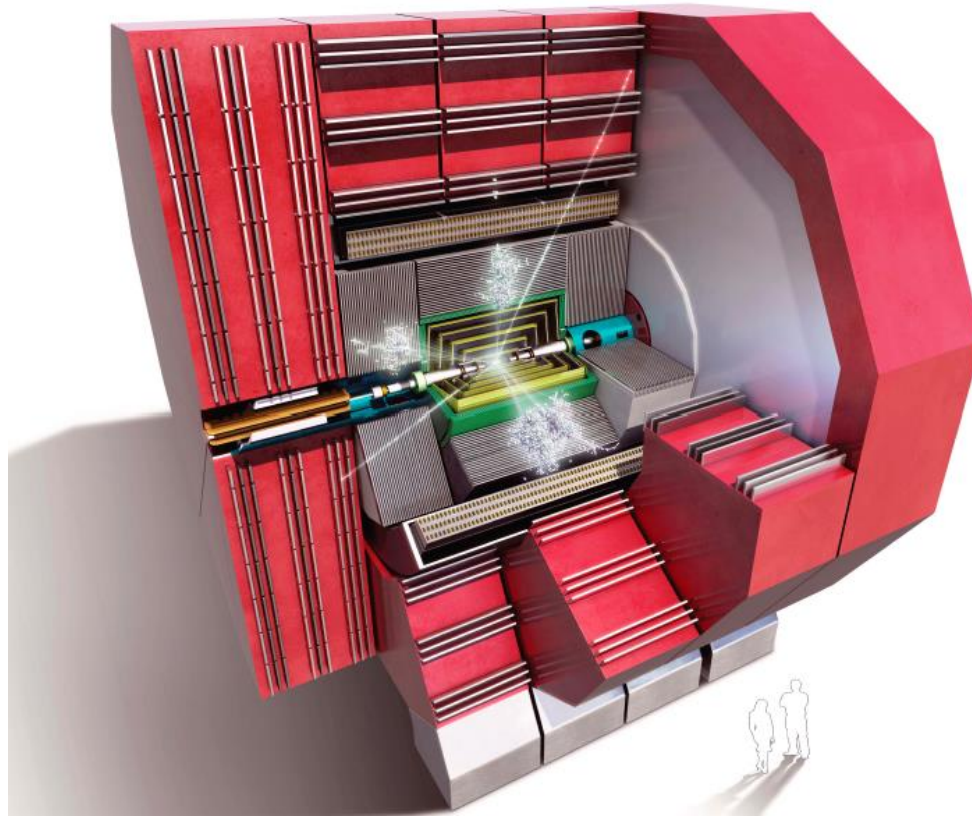
Group photo:
18:40 hrs, today,
on the lawn with the bubble chambers

Dinner transport:
Cars leave at 18:45 hrs
from the parking near building 4

Dinner:
Starts at 19:45 hrs:
Club Nautique Versoix
Chemin de Gravier 35
Port Choisieul, Versoix

Please pay 60 CHF today to Kate Ross !





Thank you