LC11 at ECT*

LC11: understanding QCD at Linear Colliders in searching for old and new physics
November 7-11 2011

Discussion about the future

Frascati, December 1st, 2010

LC11: understanding QCD at Linear Colliders in searching for old and new physics
November 7-11 2011

Organizing Committee

- Stefania De Curtis
- Albert De Roeck
- Stefano Moretti
- Giulia Pancheri, coordinator
- Francois Richard

Organization

- Organizing Committee
- Panda and active present Conveners
- New conveners

Projected Outcomes

From the accepted proposal the following outcomes are expected from this meeting:

- Further sensibilization of the Italian and European community to the strong physics interest in building a Linear Collider
- Maintaining awareness of strong correlations between LHC outcomes and Linear Colliders possibilities
- Publication of the Workshop Proceedings in both electronic and paper format as a mean to contribute to the literature on the connections between LHC and LC

How to reach the aims

- By inviting leaders in the field, both working on LHC and LC physics, who can contribute to further progress and discussions.
- The planned dates for the Workshop, coming just after the summer conferences and after the LHC will have provided additional data and physics results, will be particularly timely.
- Wide distribution on the Workshop Proceedings to the interested community will be part of the effort to reach the above objectives.

General outline

- Status of the LC projects and their connections with the LHC
- The structure of QCD from the multi-TeV to the GeV scale
- Top and jet physics
- Photon-photon and vector boson fusion processes
- EW physics
- Higgs physics
- Supersymmetry and other BSM physics
- QCD Tools for old and new physics

Monday

- **Status of the LC projects**
- 10.00- F.Richard - Update on ILC
- 10.30-M.Battaglia- Update on CLIC designs and detectors
- 11.00 coffee break
- 11.30-N.Armesto - e-/photon and e-/e- options
- 12.00-M.Krawczyk - Update on the photon/photon option

Afternoon

- **Update from LHC**
- 14:30-CDF/D0 – Update on Hggs searches at the Tevatron
- 15.00- A.De Roeck - LHC: update on Higgs searches
- 15.30- ATLAS - Re-discovering the SM at the LHC
- 16.00- coffee break
- 16.30 -CMS – W, Z and tops at LHC
- 17.00- A. Djouadi - New physics searches at the LHC
- 17.30- R.M. Godbole – The outlook for ILC after the first LHC run

Tuesday

The structure of QCD from the multi-TeV to the GeV scale

- 9.30- ATLAS/CMS - LHC: Present status of QCD measurements
- 10.00- ALICE – Particle correlations at LHC
- 10.30 -TOTEM - Forward physics now
- 11.00 coffee break
- 11.30- G.Salam - QCD effects at the LHC and multi-parton scatterings
- 12.00- C.Berger - Understanding QCD for the LHC and future TeV scale LCs through soft/collinear effective theory,

Afternoon

QCD Tools for old and new physics

- 14.30 -V.Khoze - Higgs searches in the forward region at LHC and more forward physics at the LHC
- 15.00 -P.Richardson – Angular ordering and parton showers at LHC and ILC
- 15.30 -E.Laenen - kT-factorisation and resummation in PDF/s
- 16.00 coffee break
- 16.30- B.Webber - Statistical/string/cluster hadronisation and MC simulations
- 17.00- A.Belyaev - CalcHEP, CompHEP, MadGraph, GRACE, Whizard/O'Mega,
- 17.30 -N.Kauer - HELAC/PHEGAS, BlackHat, GOLEM FeynArts/ FormCalc/ LoopTools

Wednesday

Top and jet physics
9.30- G.Corcella - Top quark physics at LCs and hadron colliders: a theoretical review
10.00 - CDF/CMS/ATLAS - Top quarks: experimental results from Tevatron & early LHC plus prospects at a full LHC and future LCs
10.30 - G.Servant - Four-top production and t tbar + missing energy events at multi TeV e+e- colliders
11.00 cofee break
11.30- S.Moretti - QCD tests in multi-jet final states: cone/clustering algorithms and event shapes from leptonic to hadronic colliders
QCD Tools for old and new physics
12.00- E.Maina - Parton Shower MCs: e.g., HERWIG, PYTHIA, SHERPA, ISAJET

Afternoon
Excursion + social dinne r

Thursday

Higgs physics

9.30- F.Piccinini - Higgs production in VBF: LHC versus ILC prospects

10.00- A.von Manteuffel - Prospects for Measurements of Higgs self-coupings at ILC and LHC

10.30- G.Bozzi - QCD effects in Higgs physics: Higgs production in association with heavy quarks, hadronic decays of Higgs bosons (bottom and charm)

11.00 coffee break

11.30 -R.Santos - Double Higgs production and decays in b/c-jets and hadronic taus.

12.00-A. Krawczyk - CPV Higgs properties in gamma-gamma resonant production

Afternoon

Forward physics at LHC and impact on ILC background from photon-photon scattering

14.30-G. Pancheri – ILC hadronic total cross-sections and forward physics at LHC

15.00-R. Godbole- Photon-photon interactions and soft particle production

15.30- E.Accomando - Gamma-gamma and gluon-gluon Higgs decays

16.00 coffee break

EW physics

16.30- G.Degrassi - QCD effects in EW physics

17.00- S.De Curtis - New gauge boson resonances, FB & LR asymmetries for heavy quarks, alternative EWSB (technicolour resonances).

Friday

Morning

Supersymmetry and other BSM physics

9.30-G.Belanger - Squark and gluino signatures, compositeness from jets, fourth generation quarks, B physics signatures, composite quarks from extra dimensions.

10.00- M.E.Gomez – Flavor violation in SUSY at ILC.

10.30- C.Grojean - No Higgs theoretical scenarios

11.00 – coffee break

11.30- M.Piccolo - The e+e- lessons so far: from the GeV resonances to LEP & SLC and prospects at GigaZ

12.00 Summary and outlook

Key participants -1

- Aldo Deandrea (IPN, Lyon, France)
- Francesca Borzumati (Tohoku University, Japan)
- Marco Battaglia (LBL, Berkeley, US)
- Carlo Carloni Calame (NExT Institute, Southampton, UK)
- Denis Comelli (INFN, Ferrara)
- Gennaro Corcella (INFN & SNS, Pisa)
- Fulvio Piccinini (INFN, Pavia)
- Ezio Maina (Universita' di Torino)
- Orlando Panella (INFN, Perugia)
- Massimo Passera (INFN, Padova)
- Marcello Piccolo (LNF, Frascati)
- Elena Accomando (NExT Institute, Southampton, UK)
- De Grassi (Roma2)

Key participants-2

Nestor Armesto (Santiago de Compostela, Spain)
Eric Laenen (NIKEF, Amsterdam)
Andreas von Manteuffel (Zurich)
Alexander Belayev (Next Institute, UK)
Valery Khoze (IPPP, Durham, UK)
Rohini Godole (CTS, IISC, India)
Maria Krawczyk (U. Warsaw)
Ilya Ginzburg (Novosibirsk)
Geraldine Servant (CERN, Geneva)
Genevieve Belanger (LAPP, Annecy)
Karsten Eggert (CERN, CH)

Carola Berger (MIT, USA)
Abdel Djouadi (France, Orsay)
Carola Berger (MIT, Boston, USA)
Abdelhak Djouadi (LPTH, Orsay, France)
Gavin Salam (LPTHE, Paris, France)
Christophe Grojean (CERN, Geneva, Switzerland)
Peter Richardson (IPPP, Durham, UK)
Nikolas Kauer (RHUL, UK)
Bryan Webber (Cambridge, UK)
Rui Santos (ISEL, Portugal)
Giuseppe Bozzi (INFN, Milano)