

SEMINARS SEMINAIRES

Vous pouvez aussi consulter
For information on these seminars, please see
<http://Bulletin.cern.ch/Seminars/>

Monday 8 November

COSMOLOGY WORKSHOP

at 14.00 hrs – TH Conference Room, bldg 4

Electroweak baryogenesis and relic dark matter abundance in the CMSSM

by Sacha DAVIDSON / CERN

Two of the cosmological attractions of Supersymmetry are that it can provide an interesting relic density of Cold Dark Matter, and that it may be possible to generate the baryon asymmetry at the electroweak phase transition. I will show that there is a (small) area of parameter space in the Constrained MSSM that is consistent with experiment, where a baryon asymmetry produced at the phase transition could survive, and where the relic dark matter density contributes $0.1 < \Omega_{\text{DM}} h^2 < 0.3$.

Monday 8 November

CERN EP SEMINAR

at 16.30 hrs – Auditorium, bldg 500*

Physics of Neutral Bosons with the L3 detector at LEP2

by Salvatore MELE / CERN, EP Division

The increase of the LEP centre-of-mass energy allows the pair production of Z bosons. Their selection and the measurement of the cross section are discussed. Possible anomalous couplings of neutral gauge bosons are investigated with this channel and with the associated $Z\gamma$ production. Events with two or more hard photons are used to perform high energy tests of QED. Some of these channels are studied in the framework of theories with large extra spatial dimensions. Previews from the current LEP run are also given.

Organiser : Fabiola Gianotti / EP Division

** Tea & coffee will be served at 16.00 hrs.*

Tuesday 9 November

LEP EXPERIMENTS COMMITTEE

Open session

at 09.00 hrs – Auditorium, bldg 500

Report on the LEP machine:

09.00 - 09.30 Status of LEP (Andy Butterworth)

Reports on the LEP experiments:

09.30–10.00 OPAL (Patricia Ward)
10.00–10.30 ALEPH (Alain Blondel)
10.30–11.00 Coffee break
11.00–11.30 DELPHI (Jesus Marco)
11.30–12.00 L3 (Ghita Rahal-Callot)

Closed session

at 14.00 hrs – 6th floor Conference room, Main Building

Wednesday 10 November

TECHNICAL PRESENTATION

09.00–13.00 hrs – Conference Room, bldg 40/RD-10

Low Level Measurements Seminar

by J. BÖTSCHI / Keithley Instruments SA

This meeting is aimed at researchers who have some experience with real-time measurements and want to learn how to make better measurements of:

- Low currents to fA noise level and below
- Low voltage to the nanovolt noise level and below
- Low and high resistances, from nano-ohms of noise up to tens of thousands of teraohms

Emphasis will be on:

- Phenomena that can affect these sensitive measurements
- Practical ways of quantifying and reducing related uncertainties
- How you can make better sensitive measurements.

The meeting will include some practical demonstrations of the methods discussed.

The speaker and other Keithley representatives will be on hand to discuss your specific measurement issues after the meeting.

Language : English

Information : S.Shearer/SPL-PS/76360

Wednesday 10 November

THEORETICAL SEMINAR

at 14.00 hrs – TH Conference Room, bldg 4

Chiral lattice gauge theories with exact gauge invariance

by Martin LUESCHER / CERN

It has recently become clear that chiral symmetry can be exactly preserved in lattice gauge theory, without violating fundamental principles or having more fermions than intended. As a result it is now possible to set up chiral gauge theories on the lattice in a theoretically appealing way. Particular attention will be paid to the cancellation of the anomaly and its interpretation in terms of local cohomology.

Thursday 11 November

SCIENCE, TECHNOLOGY & INDUSTRY SEMINAR

at 11.00 hrs – Conference Room, bldg 40/S2-B01

Technology Transfer from Space: The ESA Experience

by Pierre BRISSON / European Space Agency,
Head of Technology Transfer Programme

ESA, the European Space Agency, has set up a Technology Transfer Programme to stimulate the wider use of technology developed within the European and Canadian Communities. The goal of this programme is to promote the transfer of Innovative Technology from Space to non-

space applications.

Today, many successful transfers have been achieved, generating millions of Euros of turnover in the non-space sector.

*Further information can be found on our Web site:
<http://www.cern.ch/CERN/Technology>*

Organiser: François Bourgeois/DSU Division

Thursday 11 November

THURSDAY SEMINAR

at 14.00 hrs – TH Conference Room, bldg 4

Hierarchy and large scale ratio problem from degenerate vacua

by H.B. NIELSEN / CERN

We seek to show that requiring the existence of two (degenerate) minima in the effective Higgs field potential in a non-trivial way we get an explanation for the large scale ratio that is the mystery behind the hierarchy problem. The assumption of several degenerate minima – or vacua – is 1) an assumption we claim earlier to have had some phenomenological success with, 2) a phenomenon actually usually occurring in SUSY-models, 3) somewhat analogous to that a melting point temperature will much more often be found than any other specific temperature value, because it can be produced in slush, so to speak.

Thursday 11 November

SL/LHC PROJECT SEMINAR

at 14.15 hrs – LHC Auditorium, bldg 30, 7th fl

Electron cloud investigations

by Ian COLLINS / CERN-LHC

The build-up of an electron cloud and beam-induced electron multipacting was first observed in a test chamber in the ISR at CERN in 1977. In the positron rings of KEKB and PEP-II beauty factories, pronounced pressure rises were observed earlier this year during machine commissioning as the beam current exceeded a threshold. These dynamic pressure rises are due to electron multipacting and/or ion-induced desorption. Most recently in the SPS at CERN electron multipacting has been unambiguously observed in the presence of LHC type beams. The initial LHC design studies identified electron multipacting as a potentially serious problem for the vacuum system and it was recognised that detailed investigations of the phenomenon would be required. Since 1996 extensive studies have been undertaken to quantify and assess the detrimental effects of such an electron cloud on the cryogenic vacuum system of the LHC. In this talk an overview of the electron cloud key parameters, related to the material properties of the vacuum chamber wall, will be identified together with examples of how such parameters are quantified. The implications on the LHC beam screen design of the predicted heat loads will be given. Laboratory based investigations, identifying possible remedies to avoid excessive heat loads and pressure rises due to electron bombardment, will be discussed.

Friday 12 November

MEETING ON PARTICLE PHYSICS PHENOMENOLOGY

at 14.00 hrs – TH Conference Room, bldg 4

Identifying the neutrino mass spectrum from a supernova neutrino burst

by Amol DIGHE / CERN

We reconsider the conversions of supernova neutrinos, taking into account the recent data on the neutrino masses and mixing. We find the observable effects of neutrino conversions in the 3v schemes which describe the solar and atmospheric neutrino data. We determine the characteristics of the final spectra, including the earth effects, for both the normal and the inverted mass hierarchies. We study the role that the future detection of neutrinos from a galactic supernova would play in the reconstruction of the neutrino mass spectrum. In particular, we find that the observations of the spectra may enable us to identify the solar neutrino solution, to determine the type of mass hierarchy (normal or inverted) and to probe the mixing $|U_{e3}|^2$ to values as low as 10^{-4} – 10^{-3} .

Tuesday 16 November

CERN PARTICLE PHYSICS SEMINAR

at 16.30 hrs – Auditorium, bldg 500*

Status of underground dark matter searches

by Nigel J.T. SMITH / Rutherford Appleton Laboratory, UK

I will review the current status of direct underground searches for the neutralino, the hypothetical WIMP solution to the dark matter problem, focussing mainly on recent results from NaI scintillator detectors. Results of the current UK NaI detector array operated at Boulby mine in North Yorkshire will be discussed, illustrating a population of events of unknown origin. Diagnostic tests performed to investigate the origin of these anomalous events will be described, including alpha, beta and neutron calibrations. Future experiments with improved background discrimination and sensitivity will also be outlined.

Organiser : Jasper Kirkby / EP Division

** Tea & coffee will be served at 16.00 hrs.*

Thursday 18 November

JOINT SL/LHC PROJECT SEMINAR

at 16.00 hrs* – SL Auditorium, bldg 864, Prévessin

Electron cloud simulations

by Frank ZIMMERMANN / CERN

In the LHC beam pipe, the emission of photoelectrons and secondary electrons gives rise to a quasistationary electron cloud. The response of this electron cloud to a transversely displaced bunch resembles a short-range wake field and can cause a fast beam instability. More importantly, if no care is taken, the incident electrons induce a significant heat load on the LHC beam screen. They may also cause a pressure rise, as recently observed in the SPS.

This talk describes our computer model of the electron cloud build-up, and presents preliminary simulation results for the LHC and the SPS.

Information:

<http://www.cern.ch/CERN/Divisions/SL/news/news.html>

Organisers: Werner Herr / SL & Ruediger Schmidt / LHC

** Tea and coffee will be served at 15:30 in front of the Auditorium*

Thursday 18 November

SCIENCE AND SOCIETY

at 16.30 hrs – Auditorium, bldg 500*

Digging for the human mind: cognitive archaeology and the origins of science, art and religion

by Steven MITHEN / Reading University

Understanding the nature of the human mind is one of the greatest challenges faced by science, and one which requires the participation of many disciplines. During the last decade there have been strong arguments that an evolutionary perspective on the mind is required — just like any other species humans are the products of biological evolution and this will have moulded the way we think as much as the way we walk and talk. Some evolutionary psychologists go so far as to argue that the way we think remains largely conditioned by the lifestyle of our prehistoric hunter-gatherer ancestors. While there is both logic and substantial evidence for this claim, it fails to account for many of the activities of modern humans which have no evolutionary precedent or even the faintest trace in our closest living relative, the great apes. Notably among these are the pursuit of pure science, art and religion — activities that appear to lack any functional value. In my paper I will suggest how these can indeed be accounted for from an evolutionary perspective by examining the details of the archaeological record and examining the mental architecture of Neanderthals and other human ancestors and relatives.

Organiser : James GILLIES / EP Division

* Tea & coffee will be served at 16.00 hrs.

EDUCATION SERVICES EDUCATIFS



Information sur les cours, dates et places disponibles sur WWW:
Information about the courses, dates and places available on WWW :
<http://www.cern.ch/Training/>

ACADEMIC TRAINING

LECTURE SERIES FOR POSTGRADUATE STUDENTS

8, 9, 10, 11, 12 November

from 10.00 to 12.00 hrs

8, 10, 11, 12, November : Auditorium, bldg. 500

9 November : Council Chamber

Field Theory

by R. KLEISS / University of Nijmegen, NL

In these lectures I will build up the concept of field theory using the language of Feynman diagrams. As a starting point, field theory in zero spacetime dimensions is used as a vehicle to develop all the necessary techniques: path integral, Feynman diagrams, Schwinger-Dyson equations, asymptotic series, effective action, renormalization etc. The theory is then extended to more dimensions, with emphasis on the combinatorial aspects of the diagrams rather than their particular mathematical structure. The concept of unitarity is used to, finally, arrive at the various Feynman rules in an actual, four-dimensional theory. The concept of gauge-invariance is developed, and the structure of a non-abelian gauge theory is discussed, again on the level of Feynman diagrams and Feynman rules.

Friday* 19 November

CERN COLLOQUIUM

at 16.30 hrs – Auditorium, bldg 500**

Electronic Structure of Matter : Wave Functions and Density Functionals

by Walter KOHN / University of California at Santa Barbara and ETH-Zürich;

Nobel Prize in Chemistry 1998

Since the 1920s Schrödinger wave functions have been the principal theoretical concept for understanding and computing the electronic structure of matter. More recently, Density Functional Theory (DFT), couched in terms of the electronic density distribution, $n(r)$, has provided a new perspective and new computational possibilities, especially for systems consisting of very many (up to ~1000) atoms. In this talk some fundamental limitations of wave function methods for very-many-atom-systems will be discussed. The DFT approach will be explained together with some physical/chemical applications and a discussion of its strengths and weaknesses.

Organiser : Luigi DI LELLA / EP Division

* Please note unusual day.

**Tea & coffee will be served at 16.00 hrs.

ENSEIGNEMENT ACADEMIQUE ACADEMIC TRAINING

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ACADEMIC TRAINING

LECTURE SERIES FOR POSTGRADUATE

15, 16, 17, 18 & 19 November

from 11.00 to 12.00 hrs – Auditorium, bldg 500

QCD

by B. WEBBER / CERN-TH

The lectures will first cover the basic properties of QCD: the Lagrangian, the running coupling, asymptotic freedom and colour confinement. Next, some examples of perturbative calculations in electron-positron physics (total cross sections and event shapes) will be given. The “parton branching” approach will then be used to derive the evolution equations for hadron structure functions and jet fragmentation functions.

Comparisons with data on deep inelastic scattering and jet production will be given. Hadronization models will be described and compared with recent data. If time permits, non-perturbative corrections to perturbative QCD predictions will be also be discussed.