

SEMINARS SEMINAIRES

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<http://Bulletin.cern.ch/Seminars/>

Monday 6 December

DETECTOR SEMINAR

at 11.00 hrs – Conference room, bldg 13/2-005

Development of MicroMegas and recent experimental results

by I. GIOMATARIS / DAPNIA-SACLAY

MicroMegas is a novel two-stage parallel plate avalanche chamber with narrow amplification gap (50-100 μm) defined by the anode plane and a cathode plane made by a thin metal microgrid. It combines high accuracy, high rate capability and robustness. The principle of the operation and basic properties of the detector will be overviewed: the signal development, the gain, the positive ion build-up, the energy resolution, the homogeneity of large area detectors, the efficiency, rate capability and radiation resistance. Special emphasis will be devoted to recent results obtained in high-energy pion beam where a space resolution of 12 μm has been measured and the high rate capabilities of the detector were explored. Finally a novel photodetector operating in the MICROMEAS mode is presented. Using a solid photocathode (CsI) deposited on the microgrid excellent performances have been observed: high single-electron detection efficiency and a time resolution of 680 ps has been measured. The detector is suitable for many applications in physics or for high rate imaging devices.

Information:

http://www.cern.ch/CERN/Divisions/EP/Seminars_Welcome.html

Organiser: Rui RIBEIRO / EP Division

Monday 6 December

COSMOLOGY WORKSHOP

at 14.00 hrs – TH Conference Room, bldg 4

Lattice results on the electroweak phase transition in the SM and MSSM

by Z. FODOR / Eötvös University

The phase diagram of the 4-d finite temperature electroweak phase transition is given in the standard model by lattice techniques. The phase transition is of first order for Higgs boson masses below 72.1 ± 1.4 GeV, which is excluded by the LEP Higgs bound. The electroweak phase transition is also studied by lattice simulations in the MSSM, which is a more promising candidate for successful baryogenesis.

Tuesday 7 December

DUALITY WORKSHOP

at 14.00 hrs – TH Conference Room, bldg 4

Aspects of thermodynamics in the AdS/CFT correspondence

by David BERMAN / Utrecht

Tuesday 7 December

CERN PARTICLE PHYSICS SEMINAR

at 16.30 hrs – Auditorium, bldg 500*

Cosmic Rays from 10^6 eV to 10^{14} eV and beyond

by Alan WATSON / University of Leeds, UK.

The question of the origin of cosmic rays above 10^{14} eV remains unanswered. I will review data - all taken using the extensive air shower technique - on the energy spectrum, arrival direction and mass composition from 10^{14} eV to the highest energies, and describe some of the deductions made about their origin. At the highest energies the surprise is that particles of 10^{20} eV and beyond are seen at all: I will outline some of the attempts made to explain them and the new experiments being developed to extend our knowledge of them.

Organiser: Jasper KIRKBY / EP Division

* Tea & coffee will be served at 16.00 hrs.

Wednesday 8 December

PS SEMINAR

at 11.00 hrs – PS Auditorium, bldg 6/2-024

Progress on CLIC, a Multi-TeV e-e Linear Collider

by J.-P. DELAHAYE / CERN

The Compact Linear Collider (CLIC) studied at CERN aims at energies as high as 5 TeV in the center of mass and a luminosity of 10^{34} cm⁻² s⁻¹ and is thus an accelerator contemplated for the post-LHC era. The length and cost of the overall complex is minimized by using high accelerating fields (150 MV/m) produced in 30 GHz normal-conducting structures by an intense low energy primary electron beam. The two beam acceleration technique is potentially cost effective to generate the RF power (400 MW/m) required by such machines. In its present version, it relies on a novel scheme which will be tested in a new test facility (CTF3). The results of CTF2 and the design of CTF3 will be presented.

Organiser: B. AUTIN / PS Division

Wednesday 8 & Thursday 9 December

5TH RD49 AND COTS WORKSHOP

Wednesday 8 December

14.00 to 18.00 hrs – TH conference room, bldg 4

COTS and dosimeters session

Thursday 9 December

at 09.00 hrs – Conference room 13/2-005

09.00-13.00 SEE effects session

14.00-18.00 Radiation tolerant DSM ASICs session

Organiser: Pierre Jarron/EP Division

The complete agenda is available at the WEB address:

<http://www.cern.ch/RD49/0812.htm>

Thursday 9 December*

COMPUTING COLLOQUIUM

at 11.00 hrs* – TH Auditorium, bldg 4

Knowledge Management - Hype or Reality??

by Cathy LASSER / CIO, Director of Information Technology for IBM Research

The explosion of data and information is dramatically changing the way an organization makes decisions. It is no longer who you know, but what you know. The more successful organizations will use knowledge as a precious commodity. Knowledge is becoming the new currency.

All companies, from small independent firms to large corporate enterprises, need to be able to manage and use knowledge to successfully compete in the fast paced global economy. Technological innovations will broaden capabilities and enable business to exploit the information they already have.

Cathy Lasser, CIO, Director of Information Technology for IBM Research will discuss Knowledge Management. What it is, what it isn't and how it can impact your organization.

About the speaker

Cathy joined IBM in 1978 as a programmer supporting Test Engineering in Endicott, New York. In 1982, Cathy joined the IBM Credit Corporation where she developed and managed the information center and advanced technology development departments. In 1993, Cathy joined the PC Company where her organization was responsible for executive information systems, decision support systems and manufacturing process support. She then came to IBM Research in 1996 as executive assistant to the Senior Vice President of Research. Cathy is also a member of the Research Management Committee. Cathy holds a BS in Mathematics/Computer Science from SUNY Binghamton and an MBA in Finance from Iona college.

* Please note the usual date and time

Thursday 9 December

THURSDAY SEMINAR

at 14.00 hrs – TH Conference Room, bldg 4

Transverse momentum dependence of the Landau-Pomeranchuk-Migdal effect and the QCD dipole picture

by U. WIEDEMANN / CERN-TH

High pt jets will be one of the new probes of the dense matter produced in relativistic heavy ion collisions at RHIC and the CERN LHC. Deviations from factorized pQCD due to final state rescattering are sensitive to the density and coupling in the plasma and affect key observables like the high momentum tails of single particle spectra. The corresponding study of "jet quenching", i.e., the study of the medium-induced QCD radiative energy loss is the non-abelian extension of the analogous QED problem considered long ago by Landau, Pomeranchuk and Migdal (LPM). Our discussion exploits the close relation between the LPM-effect and the crossing symmetry related process of virtual photoabsorption in a spatially extended colour field. Nuclear shadowing of DIS structure functions and the radiative energy loss of partons in relativistic heavy ion collisions can thus be described in a unified framework with only one model parameter which measures the transverse colour field correlations in the target medium. Our main result is an explicit formula for the abelian and non-abelian LPM radiation cross section which is differential in both the transverse momenta of the radiated gluons and the radiating hard parton. The physics of the corresponding radiation pattern will be discussed in detail.

Thursday 9 December

SL SEMINAR

at 16.00 hrs* – SL Auditorium, bldg 864

Energy Calibration with Energy Loss Measurements

by Anke-Susanne MUELLER / CERN

The measurement of the W Boson mass at LEP2 requires a determination of the beam energy with the highest possible accuracy.

Present schemes for energy calibration above the W+W-threshold of 80 GeV are based on extrapolations of resonant depolarization measurements to high energy. Since such extrapolations involve systematic uncertainties, alternative methods have been studied which are based on measurements of the energy loss due to synchrotron radiation. Because this energy loss increases with the fourth power of energy, observables sensitive to the energy loss per turn can be used to determine the beam energy.

Three different methods to measure the energy loss have been studied. The first technique is based on the analysis of electron positron difference orbits, the second on measurements of the damping of horizontal coherent oscillations after an excitation and the last one on studies of the relation between synchrotron tune Qs and total accelerating voltage. As a side product, the analysis of the damping of coherent oscillations gives an opportunity to measure the horizontal detuning with amplitude (anharmonicity) which is an important parameter for the understanding of the dynamic aperture of storage ring optics.

This talk will focus on the description of the different approaches to the energy loss measurement and discuss advantages and disadvantages of the methods.

Information:

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

Organiser: Werner HERR / SL Division

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

Friday 10 December

MEETING ON PARTICLE PHYSICS PHENOMENOLOGY

at 14.00 hrs – TH Conference Room, bldg 4

Theory of hadron diffraction: grand total

by V.A. PETROV / Serpukhov

This is a mini-review of the present state of affairs and problems in one of the most difficult subjects of modern high-energy physics. Basic concepts (Pomeron, hadron structure etc) and results (both experimentally verifiable and "metaphysical") of the principal schools competing in the field will be critically analyzed. Outlooks for LHC will be outlined.

Monday 13 December

SCIENCE, TECHNOLOGY & INDUSTRY SEMINAR

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

IBA: the short, biased story of a university spin-off in the field of particle accelerators

by Yves JONGEN / President, Ion Beam Applications S.A., Louvain-la-Neuve, Belgium

In 1985, the author, then director of the cyclotron research center at the University of Louvain, developed with colleagues an innovative cyclotron design for the production of medical radio-isotopes. While looking for money to build

a prototype, the idea of forming an industrial company resistance within the laboratory. In 1986, Ion Beam Applications was incorporated, with a capital of 0.6 Million Euro, 5 employees and the hope to reach at equilibrium a size of 15 people. The growth of the new company was tumultuous, with some great successes and a few near disasters. The range of accelerators offered was enlarged to make IBA less dependant of the variations of a single small market. From the radio-isotopes cyclotrons market, IBA entered into the market of proton therapy, then in the industrial application of electron beams with the Rhodotron. Twice over the years the company had to restructure to face heavy losses.

In 1997, in response to an attempt of hostile take-over, the employees formed a cooperative holding company, and took a majority in the company capital. The company got large orders in proton therapy and became quite profitable. Last year, IBA entered on the Brussels stock exchange and, thanks to the money raised this way, started to grow rapidly by acquisitions.

Today, IBA is a 1100 employee multi-national group, with 44 factories over the world. It has absorbed other accelerator companies such as Scanditronix or Radiation Dynamics Inc. (Dynamitrons). The annual turn-over is 150 million Euro, and the market capitalization 1.2 billion Euro. But it remains to be seen if the new larger company will keep the warm relations, the enthusiasm and the entrepreneurial spirit it had during the early years.

Tuesday 14 December

SCIENCE, TECHNOLOGY & INDUSTRY SEMINAR

at 16.00 hrs – Conference Room, bldg 40/S2-B01

The Technology Database: A Tool to Foster Technology Transfer at CERN

by Chris PARKMAN / CERN-DSU, Industry and Technology Liaison Office

In its session of March 10 of this year, the CERN Finance Committee approved a new policy for Technology Transfer at CERN. The policy document describes a database for CERN's technology with two principal objectives: to act as a point of contact between CERN and the Member States for the flow of technology information, and as a tool for the gathering and monitoring of technology developments at CERN.

In the early part of the year, a prototype version of the database was made available on the CERN web site. With increasing use and as experience has been accumulated, its implementation and functionality have been progressively enhanced.

Now regularly accessed by users at CERN, in the Member States and world-wide, at a rate of some 30 "hits" per day, it functions as a shop-window for CERN's technological developments. In addition to its public role, the database also acts as a tool for the various services concerned for the tracking of CERN's intellectual property rights protection procedures.

This talk will describe the functionality of the database with some background information on its implementation. In addition, statistics based on the first nine months of its use will be presented.

Tuesday* 14 December

CERN COLLOQUIUM

at 16.30 hrs – Auditorium, bldg 500**

Hiding Infinities

by Martinus J.G. VELTMAN / University of Utrecht and University of Michigan
Nobel Laureate in Physics 1999

Organiser : Luigi DI LELLA / EP Division

* Please note unusual day.

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

Wednesday 15 December

PS SEMINAR

at 11.00 hrs – PS Auditorium, bldg 6/2-024

High Intensity Cyclotrons

by P. MANDRILLON / Cyclotron Laboratory, Nice

Several high intensity cyclotrons have been studied in the framework of the Energy Amplifier proposed by C. Rubbia. After summarising the results of beam dynamics studies for investigating space charge effects and the criteria for getting highly efficient extraction processes, two basic designs will be presented. These two schemes allow to investigate an hybrid cyclotron-linac system, where the beam extracted from the cyclotron is available for further acceleration in LEP-2 superconducting cavities adapted for reduced beta.

Organiser: B. AUTIN / PS Division

Thursday 13 January

LHC PROJECT SEMINAR

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

General LHC project management

by Paul FAUGERAS / CERN-AC

Monday* 17 January

CERN COLLOQUIUM

at 16.30 hrs – Auditorium, bldg 500**

Seeds of Cosmic Structure :

Quantum Fluctuations in the Primordial Soup

by Rocky KOLB / Fermilab & University of Chicago

If the early universe had a phase of rapid expansion known as inflation, then the pattern of small quantum fluctuations may be imprinted on the universe in the form of large scale structure and fluctuations in the background radiation temperature. In the talk I will explain how something as small as quantum fluctuations can lead to something as large as a galaxy, and review observational tests of the idea.

Organiser : Luigi DI LELLA / EP Division

* Please note unusual

* Tea & coffee will be served at 16.00 hrs.

UNIVERSITE DE GENEVE

Département de physique nucléaire et corpusculaire
24, Quai Ernest-Ansermet
1211 GENEVE 4
Tél.: (022) 702 6273
Fax: (022) 781 2192

Mercredi 8 décembre

SÉMINAIRE DE PHYSIQUE NUCLÉAIRE

à 17.00 hrs - Auditoire Stückelberg

Search for anti-matter and geomagnetic effects on trapped Particles with the AMS-01 detector

par Giovanni AMBROSI

The AMS experiment is a magnetic spectrometer designed and constructed to measure charged particles in space. The detector uses a permanent magnet together with a precision silicon tracking detector, time-of-flight counters and areogel counters. The first 10-day mission of AMS took place on June 2, 1998 on board the NASA space Shuttle Discovery. The construction of the AMS detector, results on the anti-matter search and geomagnetic effects on trapped particles will be presented.

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francoise.benz@cern.ch

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LECTURE SERIES

FOR POSTGRADUATE STUDENTS

6, 7, 9 & 10 December

from 11.00 to 12.00 hrs – Auditorium, bldg 500

Basic Processes and Trends in Gaseous Detectors

by F. SAULI / CERN-EP

Almost a century after the invention of the proportional counter, a large research effort is still devoted to better understand the basic properties of gaseous detectors, and

to improve their performances and reliability, particularly in view of use at the high radiation levels expected at LHC. In the first part of the lectures, after a brief introduction on underlying physical phenomena, I will review modern sophisticated computational tools, as well as some classic “back of the envelope” analytical methods, available today for estimating the general performances of gaseous detectors. In the second part, I will analyze in more detail problems specific to the use of detectors at high rates (space charge, discharges, aging), and describe the recent development of powerful and perhaps more reliable devices, particularly in the field of position-sensitive micro-pattern detectors.