

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

F. Benz Secretariat ☎ 73127
francoise.benz@cern.ch

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.

**ENSEIGNEMENT TECHNIQUE
TECHNICAL TRAINING**

Monique Duval ☎ 74924
monique.duval@cern.ch

PLACES DISPONIBLES/PLACES AVAILABLE

Des places sont disponibles dans les cours suivants :
Places are available in the following courses :

Introduction to intellectual property rights and entrepreneurship : 9.11.99 (1.5 days)
Programming in JAVA level 2 : 10 – 12.11.99 (3 days)
LabView Hands-on (E or F) : 15.11.99 a.m.
C++ for particle physicists : 22 - 26.11.99 (6 lectures)
BridgeView Hands-on (E or F) : 22.11.99 a.m.
Signal Integrity Analysis : 30.11 – 1.12.99 (2 days)
EXCEL : 30.11 – 3.12.99 (4 jours)
Cours pour TSO : 30.11 et 2.12.99 (2 matinées)
FileMaker – 7 - 10.12.99 (4 jours)
Unix for non-programmers – 13 - 15.12.99 (3 days)

Si vous désirez participer à l'un de ces cours, inscrivez-vous électroniquement en direct depuis les pages de description des cours dans le Web que vous trouvez à l'adresse : <http://www.cern.ch/Training/>, ou remplissez une "demande de formation" disponible auprès du Secrétariat de votre Division ou de votre DTO (Délégué divisionnaire à la formation). Les places seront attribuées dans l'ordre de réception des inscriptions.

If you wish to participate in one of these courses, please apply electronically directly from the course description pages that can be found on the Web at : <http://www.cern.ch/Training/> or fill in an "application for training" form available from your Divisional Secretariat or from your DTO (Divisional Training Officer). Applications will be accepted in the order of their receipt.

**BUILDING SOFTWARE FOR ANALYSIS AND RECONSTRUCTION
USING OO TECHNIQUES AND PACKAGES**

Tuesday 16 to Friday 19 November

Morning lectures in bldg 40/SS-C01
Afternoon hands-on sessions in bldg 572/Room 23

The course is free of charge but people wishing to participate in the hands-on sessions must register (maximum 18). The only limit for the lectures in the mornings is the capacity of the room (92).

People with EDH accounts can register electronically via -

http://www.cern.ch/Training/ENSTEC/P9798/Prototypes/lhc++_e.htm

Others should either ask their divisional training officer to register them or send a completed training application form to Technical Training/PE.

Overview

The course combines software engineering lectures with exposure to the software technologies and packages relevant for LHC experiments. It shows, in a practical sense, how software engineering can help in the development of HEP applications based on the LHC++ software suite and also gives a taste of working on large software projects that are typical of LHC experiments. The lectures provide an overview of LHC++ and cover those aspects of software engineering most relevant for HEP software development. The hands-on exercises allow students to develop simple applications using components of the LHC++ suite while following a defined software process. Limited C++ programming is necessary for the exercises and it is assumed students are aware of the basic concepts of object oriented design.

The course was first given at the CERN School of Computing in September (see file:/afs/cern.ch/user/j/jones/public/CSC99/trackoverview.html for more details).