

SEMINARS SEMINAIRES

Monday 13 May

PRESENTATION

at 10.00 hrs – CN Auditorium
bldg 31/ 3-005

CATIA implementation and its use in three-dimensional design at Boeing

by Chris KLOMP / Director, CATIA Products,
Computing Management Organization, The Boeing
Company, USA

The utilization of CATIA in the Commercial Airplanes Group will be covered, with particular emphasis given to the use of CATIA in support of the new airplane (777) design effort. Of general interest will be some CAD/CAM history at Boeing, rationale for the selection of CATIA as the sole company-wide product definition tool and the process designed to utilize CATIA technology best for the design-in-manufacturing-environment. Also addressed are systems issues associated with what has grown to be the largest commercial CATIA installation in the world.

Monday 13 May

THEORETICAL SEMINAR

at 14.00 hrs – TH Conference Room

Colour transparency in high energy heavy ion collisions

by Mark STRIKMAN / Leningrad

Monday 13 May*

CERN COLLOQUIUM

at 16.30 hrs – Auditorium**

A Program towards a Fusion Reactor

by P-H. REBUT / JET Joint Undertaking,
Abingdon, UK

Near breakeven conditions have been attained in the JET tokamak, with beryllium as the first wall material. A fusion triple product ($n_D n_T \tau_E$) of $8-9 \times 10^{20} \text{ m}^{-3} \text{ s keV}$ has been reached (within a factor of 8 of that required in a fusion reactor). However, this has only been achieved transiently. At high heating powers, an influx of impurities still limits the achievement of better performance and steady state operation. In parallel, an improved quantitative understanding of fusion plasmas has emerged from the development of a particular plasma model. Good quantitative agreement is obtained between the model and JET data. The main predictions are also consistent with statistical scaling laws. With such a model, a predictive capability begins to emerge to define the parameters and operating conditions of a DEMO, including impurity levels. Present experimental results and model predictions suggest that impurity dilution is a major threat to a reactor.

A divertor concept must be developed further to ensure impurity control, before a DEMO can be constructed. A New Phase for JET is planned in which an axi-symmetric pumped divertor configuration will be used to address the problems of impurity control, plasma fuelling and helium ash exhaust. It should demonstrate a concept of impurity control and demonstrate the operational domain for such a device. A single Next Step facility (ITER) is a high risk in terms of physics, technology and management, since it does not provide a sufficiently sound foundation for a DEMO. A Next Step Program is proposed, which could comprise several complementary facilities, each optimised with respect to specific clear objectives. In a minimum program, there could be two Next Step tokamaks, and a Materials Test Facility. Such a program would allow division of effort and sharing of risk across the various scientific and technical problems, permit cross comparison and ensure continuity of results. It could even be accomplished without a significant increase in world funding.

* Please note unusual day

** Tea and coffee will be served at 16.00 hrs

Tuesday 14 May

SYMPOSIUM – HISTORY OF CERN, 1966-1980

Morning session : Council Chamber

- 09.30 *The choice of big equipment*
D. Pestre
- 10.15 *Some remarks about teamwork*
J. Krige
- 11.00 *Coffee break*
- 11.15 *Electronic detectors at CERN*
I. Gambaro
- 12.00 *Construction & exploitation of the ISR*
A. Russo

Lunch break

Afternoon session : Auditorium

- 14.00 *Strong interaction physics*
L. DiLella
- 14.45 *Weak interaction physics*
K. Winter
- 15.30 *Coffee break*
- 15.45 *The SC and Isolde*
G. Hansen
- 16.30 *Accelerator art and expertise at CERN*
F. Bonaudi
- 17.15 *Closing remarks*

Please note that John Iliopoulos, who is writing the chapter on theory, gives his talk at 14.00 hrs on Friday 10 May in the Theory Conference Room, bldg 4/3-006.

Tuesday 14 May

PRESENTATION

at 10.00 hrs – bldg 13/2-005*

High transaction database processing using a parallel transputer system

New horizons with massively parallel architectures

by Patrick EVANS / Technical Marketing Manager, Meiko Ltd

This presentation will discuss how the combined architectures of the Meiko Computing Surface and ORACLE's Parallel Server can produce transaction rates that scale from fifty to many thousands per second. This application of 'massively parallel' technology changes the traditional cost/performance profile and opens up a completely new range of information processing solutions that can be tackled within HEP and in the commercial market.

The talk will cover how such systems can provide a guaranteed level of response to many different types of conflicting users. The user population and the databases may be very large. An architectural overview of the Meiko Computing Surface will be provided, discussing the benefits of the 'distributed memory' parallel processing model over other computer architectures. This will be followed by a description of how the ORACLE Parallel Server makes use of this new technology to deliver a high performance solution.

** Please note the unusual location*

Organizer : Sverre Jarpe / CN, sverre@cernvm.cern.ch

Tuesday 14 May

PRESENTATION

at 10.00 hrs – CN Auditorium
bldg 31/3-005

New board level & systems products

by Paul STEVENS / Motorola, Brussels & Günther GUZIELSKI / Motorola, Hamburg

Motorola will present their latest VMEbus board and systems level products, both hardware and software, including :

- *The MVME167, MC68040 and MVME187, MC88100 - based single board computers.*
- *Futurebus+ and S-bus products*
- *Extended VSB*
- *VMEexec update*

Organizer : Chris Parkman / CN,
pmn@cernvm.cern.ch

Wednesday 15 May

PS SEMINAR

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

A tau-charm factory in Spain : prospects after the Sevilla meeting

by Y. BACONNIER / CERN-PS

The Spanish authorities have asked CERN to undertake a study for the construction of a tau-charm facility in Spain. The scenario studied by CERN together with the scope and layout of the laboratory will be described. This seminar will also report on the results from the 'Tau-charm in Spain' meeting held in Sevilla recently (29 April-2 May 1991).

Wednesday 15 May

THEORETICAL SEMINAR

at 14.00 hrs – TH Conference Room

Pomeron-odderon degeneracy. Origin and consequences

by V.A. PETROV / IHEP, Protvino

The problem of the influence of confinement on the high energy behaviour of hadron scattering will be discussed.

Wednesday 15 May

COMPUTING SEMINAR

at 16.00 hrs – CN Auditorium
bldg 31/3-005

Component-Oriented Software Development in ITHACA

by Oscar NIERSTRASZ / Centre Universitaire d'Informatique, Genève

The ITHACA environment offers an application support system which incorporates advanced technologies in the fields of object-oriented programming in general and programming languages, database technologies, user interface systems and software development tools in particular. ITHACA provides an integrated and open-ended toolkit which exploits the benefits of object-oriented technologies for promoting reusability, tailorability and integratability, factors which are crucial for ensuring software quality and productivity. Industrial applications from the fields of office automation, public administration, finance/insurance and chemical engineering are developed in parallel and used to evaluate the suitability of the system.

The ITHACA project is funded as a Technology Integration Project by the Commission of the European Communities as part of the ESPRIT II programme. Oscar Nierstrasz is currently Maître d'Enseignement et de Recherche at the Centre Universitaire d'Informatique (CUI) of the University of Geneva.

Organizer : N. Cremel / CN

Thursday 16 May

COMPUTING SEMINAR

at 10.30 hrs* – CN Auditorium
bldg 31/ 3-005

XLIPS – an environment for image processing / computer vision research on Unix workstations

by Lukas ROSENTHALER / Institute of Communication Technology, Image Science Lab, ETHZ

The goal XLIPS is to provide a basis for any research dealing with image processing / computer vision. It will provide most well known image processing functions (e.g. convolution,

Fourier transform etc.). The main target however is the extendability of the system. XLIPS is designed for this purpose by using an object oriented approach. Many different file formats are supported. XLIPS is in the public domain.

XLIPS consists of 3 layers:

- 1) an object oriented library of basic i/o functions and conversions. These routines allow an easy development of own image processing algorithms. Through a very simple software interface, it is possible to read/write files in many file formats and to connect to the interactive display module.
- 2) an interactive display module which allows direct manipulation of image contrast, pan and zoom, profiling, etc.
- 3) a set of image processing functions including linear and nonlinear filtering in space and Fourier domain, edge detectors (eg. Sobel, Canny), etc. The first part of the talk will present the concept of XLIPS and some implementation details, the second part will be a online demonstration how XLIPS works.

Since 1987 Dr. Lukas Rosenthaler is postdoc at the Institute of Communication Technology, Image Science lab, ETH Zurich, and does research in the field of computer vision. In addition he is in charge of developing a new environment for computer vision research on Unix workstations.

**Please note unusual day and time*

Organizer: N. Cremel/CN

Tuesday 21 May

BERNARD GREGORY LECTURE 1991

at 14.30 hrs – Council Chamber

Fractals in physics – from fraction dimensions to negative dimensions

by Benoit B. MANDELBROT / Physics Department, IBM, T.J. Watson Research Center, Yorktown Heights, New York & Mathematics Department, Yale University

The author will sketch a variety of problems in physics in which fractal sets and multifractal measures play a central role. He will dwell on some ways in which differential equations – which necessarily assume great smoothness in nature inevitably generate fractals – which model extreme unsmoothness. He will describe how the needs of physics have made it necessary to allow the notion of dimension, which is classically an integer, to take fractional values (a la Hausdorff-Besicovitch) and, most recently, to take negative values.

Information : M. Jacob / TH / 2414

Tuesday 21 May

CERN COLLOQUIUM

at 16.30 hrs – Auditorium*

Big Bang nucleosynthesis tests the standard models of particle physics and cosmology

by Gary STEIGMAN / Department of Physics and Astronomy, The Ohio State University & Max Planck Institut für Physik, Munich

The standard hot Big Bang model is remarkably successful in accounting for the observed abundances of the light elements in the Universe. Accurate observations of deuterium, helium-3, helium-4 and lithium-7 provide an invaluable tool for testing the standard model of cosmology and for constraining the baryon density of the Universe. The requirement of consistency between the predicted and observed abundance of helium led, more than 15 years ago, to a bound on the number of light, weakly interacting particles which has been dramatically confirmed by the beautiful LEP results. After the predictions of primordial nucleosynthesis are reviewed, they will be compared with the abundances of the light elements inferred from observational data. This confrontation of theory and observation will test the standard models and, provide constraints on the parameters of particle physics and cosmology which complement those from accelerators and telescopes.

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

Wednesday 22 May

CERN COMPUTER COLLOQUIUM

at 16.30 hrs – Auditorium

Biomolecular sequence analysis by means of neural networks

by Benny LAUTRUP / Niels Bohr Institute, Copenhagen

A centre for the study of artificial neural networks has been created at the Niels Bohr Institute in Copenhagen. The centre (called CONNECT) unites three separate groups of scientists at different locations in the Copenhagen area. The scientific objectives of the centre fall within three areas:

- 1) Analysis of biomolecular sequences (proteins and DNA) by means of neural networks. A special purpose VLSI chip will be built to implement the networks in hardware.
- 2) Neural signal processing ranging from seismic signals over early vision to the development of components of a trigger for high energy experiments.
- 3) Optical neural computing, in particular the use of non-linear optical materials for implementation of neural networks.

The seminar will contain a short introduction of CONNECT and in detail report on the results that so far have been obtained within the area of biomolecular sequence analysis concerning the 3-dimensional structure of proteins and the prediction of splice sites in DNA.

Benny Lautrup is a theoretical physicist who has worked for some time at CERN before returning to the Niels Bohr Institute where he is now head of the new centre for the study of artificial neural networks. He is the author of a book on the subject.

Thursday 23 May

PRESENTATION

at 10.00 hrs – CN Auditorium*

bldg 31/3-005

VMEbus Analogue and Digital I/O

by Jim FOWLIE / Pentland Systems Ltd, Scotland

Pentland Systems have taken on the VMEbus analogue and digital I/O board business of Burr-Brown, and are not only supporting existing hardware, but are developing the product range.

The presentation will include a profile of the company, a presentation of the distribution and support arrangements, and an overview of their products. In addition a number of case studies will be presented outlining requirements for real-world signal interfaces and associated techniques.

A demonstration of Pentland products will also be made.

Organizer : Chris Parkman /CN,
pmn@cernvm.cern.ch

** Please note unusual place*

The Conventional Wisdom is that the experimental solar neutrino flux is significantly much less than the theoretical flux. Evolutionary models of the Sun, e.g. the so-called Standard Solar Model, SSM and their errors and assumptions, are discussed. Results of helioseismology and consequent models of the sun are presented. Results from Kamiokande, Chlorine and Gallium experiments are discussed in detail. It is concluded that there is at present no significant disagreement between experiments and theories with realistic errors. Possible variations of the neutrino flux with the sunspot cycle are discussed.

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

Thursday 23 May

PARTICLE PHYSICS SEMINAR

at 16.30 hrs – Auditorium*

Solar neutrinos – review of theories and experiments

by Douglas R. O. MORRISON / CERN

TRAINING AND EDUCATION ENSEIGNEMENT

ACADEMIC TRAINING

Tel. 2844-3674

13, 14 & 15 May

11.00 to 12.00 hrs – Auditorium

Plasma Physics in the Solar System

by G. WIBBERENZ / Kiel University

Lecture 1 : **The Sun and the interplanetary medium**

Lecture 2 : **Planetary magnetospheres**

Lecture 3 : **Energetic particles into the heliosphere**

The lecture series will start with some fundamental principles of cosmic plasma physics. The main topics will deal with the sun, the interplanetary plasma, planetary magnetospheres, and energetic particles in the solar system. This includes the role of the sun in forming the heliosphere; manifestations of solar activity and the solar cycle, from large scale structures of the interplanetary medium to climatic changes; formation of planetary magnetospheres by interactions between the solar wind and planetary magnetic fields; the diversities of charged particle acceleration, in particular the role of collisionless shocks in the solar system. Some specific space projects exploring the heliosphere will be presented.

ENSEIGNEMENT GENERAL

Tél. 5811 ou 2844 (le matin)

Jeudi 16 mai

de 13.00 à 13.30 h – Amphithéâtre

Science pour tous

par Rafel CARRERAS