

Planck scale presumably – the physics of the gauge theory should have such values of its parameters (= couplings or the various coefficients of the various terms in a lattice plaquette action, etc.) that is at '(the ?) multicritical point' defined as the place in parameters space where a lot (as many as possible) of phases meet. We have here in mind first-order phase transitions, and it looks numerically that is what is found near this multicritical point. It is speculated (calculated with some phases approximated way) that the highest number of phases meet for a lot of Abelian  $U(1)$  gauge fields when these interact in groups of three by terms like  $F_{nm}$ ; Peter  $F_{nm}$ ; Paul. Such grouping in turn makes the Higgses at the multicritical point cause the breaking down to diagonal subgroups of each factor  $U(1)^3$  as a natural possibility. The number three here which comes in as the value of  $N$  maximizing  $\log(2^{(n+1)} - (N+1))$   $N$  is identified with the number of generations. That Higgs field(s) are so enormously light compared to the Planck scale is explained by the multicriticality principle as the need for the mass square being between positive and negative. Our fine structure constant predictions at the Planck scale agree to the order of magnitude of our calculations until now, which means of the order of 7%.

## EDUCATION SERVICES EDUCATIFS

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### SUMMER STUDENT LECTURES

#### This week

|               |       |                 |                                                        |
|---------------|-------|-----------------|--------------------------------------------------------|
| Mon. 26 July  | 09.00 | L. Foà          | Collider Physics (5)                                   |
|               | 10.15 | H. Hilke        | Particle Detectors (1)                                 |
|               | 11.15 | C. Jarlskog     | Introduction to Particle Physics (6)                   |
| Tue. 27 July  | 09.00 | H. Hilke        | Particle Detectors (2)                                 |
|               | 10.15 | H. Hilke        | Particle Detectors (3)                                 |
|               | 11.15 | L. Foà          | Collider Physics (6)                                   |
| Wed. 28 July  | 09.00 | H. Hilke        | Particle Detectors (4)                                 |
|               | 10.15 | Ph. Charpentier | Trigger and Data Acquisition of a large experiment (1) |
|               | 11.15 | R. Kleiss       | The Standard Model (1)                                 |
| Thur. 29 July | 09.00 | F. James        | Monte Carlo, random numbers and neural networks (1)    |
|               | 10.15 | Ph. Charpentier | Trigger and Data Acquisition of a large experiment (2) |
|               | 11.15 | R. Kleiss       | The Standard Model (2)                                 |
| Fri. 30 July  | 09.00 | F. James        | Monte Carlo, random numbers and neural networks (2)    |
|               | 10.15 | R. Kleiss       | The Standard Model (3)                                 |
|               | 11.15 | Ph. Charpentier | Trigger and Data Acquisition of a large experiment (3) |

#### Next week

|               |       |                       |                                                     |
|---------------|-------|-----------------------|-----------------------------------------------------|
| Mon. 2 August | 09.00 | F. James              | Monte Carlo, random numbers and neural networks (3) |
|               | 10.15 | R. Kleiss             | The Standard Model (4)                              |
|               | 11.15 | B. Autin/D. Manglunki | Accelerators : past, present and future (1)         |

### Tuesday 3 August

#### CERN PARTICLE PHYSICS SEMINAR

at 16.30 hrs – Auditorium

**Status report on the CDF top search**

by Hans GRASSMANN / SSCL, Dallas

### Wednesday 4 August

#### ISOLDE SEMINAR

at 16.00 hrs – TH Conference Room

**The lattice site of Au in Be after the  $^{197\text{m}}\text{Hg}$  24 h isotope implantation & decay**

by J.C. SOARES / Lisbon & CERN-PPE

### Thursday 5 August

#### CERN COLLOQUIUM

at 16.30 hrs – Auditorium

**Endangered support of basic science**

by Victor F. WEISSKOPF / M.I.T.