**Title:** From Raw Data to Physics Results

**Lecturer:** JACOBSEN, R

**Date and Times:** 28th July at 11:15
29th July at 11:15

**Summary of the proposed talk**
These series of lectures describes the work that lies between the raw data taken by the detector elements and the physics variables used to study particular reactions. We start by defining some simple physics variables of interest, then describe the fitting process used to extract values from the observed patterns in typical detectors. This is followed by a discussion of the various problems of pattern recognition in tracking, calorimetry and particle identification detectors. The process of calibration and alignment is surveyed, with emphasis on getting "reasonable" results in the absence of formally complete information. Finally, the role of Monte Carlo simulation in understanding the quality of the obtained information is examined. Throughout, we emphasize how the use of "composite" observables is required due to what our instrumentation and reconstruction can achieve.

**Prerequisite knowledge and references:**
It would be helpful for students to know:
a) how measurements are made in physical detectors, for example how a tracking chamber "sees" a charged particle or how a calorimeter measures energy;
b) that physics processes result in photons, leptons, etc., which we then want to detect and analyze.

**Professor Robert Jacobsen**

- **1978** : Graduated from MIT
- **1991** : PhD in Physics, Stanford University
- Worked primarily in e+ e- Physics for the past 10 years, with particular emphasis on the need to get maximal performance out of the experimental apparatus used for out measurements.
- This has included work on tracking with the MarkII/SLC silicon vertex detector to gab b quark decays of the Z, on the energy calibration of LEP used for Z mass and width measurements, and currently on the reconstitution needes to study CP violation via exclusive B decays at the PEPII B study CP violation via exclusive B decays at the PEPII B factory.