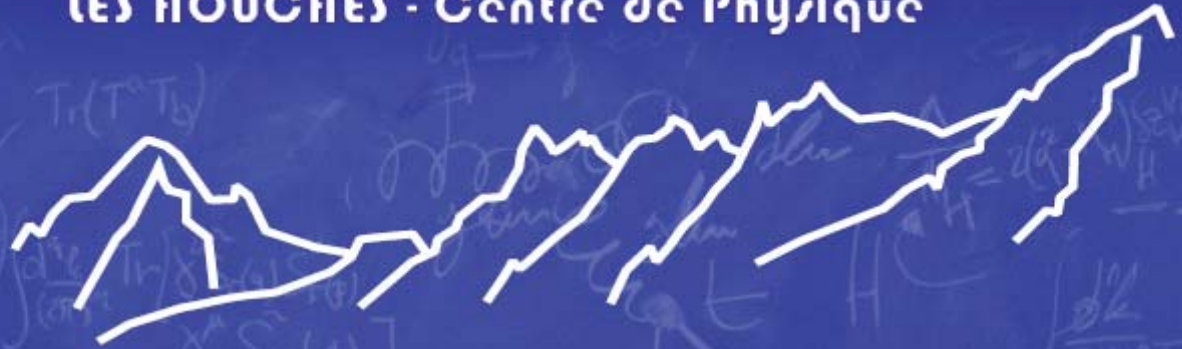


LES HOUCHES - Centre de Physique



Workshop

PHYSICS at TeV COLLIDERS

les Houches, June 11-29 2007

Session 1



Aim and Format of the Workshop

This **Workshop** is the fifth in a series whose aim is to **bring together theorists and experimentalists** working on the phenomenology of the upcoming **TeV colliders**. The emphasis will be on physics at the LHC with a particular attention on the one hand on the progress in new techniques for the simulation of Standard Model processes and on the other on the latest developments concerning new mechanisms of symmetry breaking and the New Physics.

Themes to be covered in the Workshop range from **Quantum ChromoDynamics** to the mechanism of **Electroweak Symmetry Breaking** (notably **Higgs physics**), **Supersymmetry**, the phenomenology of **Extra-dimensions** and **Little Higgs models**. The **Dark Matter** connection between cosmology and astrophysics and collider physics will be addressed. The interdependence between the signals from the New Physics and their respective backgrounds will be stressed. Three Working Groups have been set up covering these different aspects of the Physics at the LHC.

- ◆ **WG NLO Multi-leg** will address the issue of the theoretical predictions for **multileg processes**, in particular beyond leading order, and the possibility of implementing these calculations in Monte Carlos. This working group aims at a cross breeding between novel approaches (twistors, bootstraps,...) and improvements in standard techniques.
- ◆ **WG SM Handles and Candles** will review and critically compare existing tools for **SM processes**, covering issues in pdf, jets and Higgs physics.
- ◆ **WG New Physics** is a **beyond SM** group, subdivided into SUSY and new models of symmetry breaking. It will also address the issue of model reconstruction and model independent searches based on topologies.
- ◆ There will also be an **intergroup** dedicated to **Tools and Monte Carlos**. This intergroup will liaise with **all** WG with the task of incorporating some of the issues and new techniques developed in these groups in view of improving Monte Carlos and setting **standards and accords** among the simulation codes to better meet the experimental needs.

- ▶ [Aim and Format](#)
- ▶ [Working Groups](#)
- ▶ [WG Wiki Pages](#)
- ▶ [Discussion Forum](#)
- ▶ [Programme in Les Houches](#)
- ▶ [List of participants in LH](#)
- ▶ [Practical Infos](#)
- ▶ [Contact, Secretariat](#)
- ▶ [Organizing Committees](#)
- ▶ [Previous Workshops](#)
2005 2003 2001
1999

The (original) Les Houches Accords

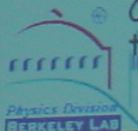


HepUP Event Record

- Successful
 - ⊗ Majority of MC talks at Les Houches mention it.
 - ⊗ Every ME/PS project that I've heard discussed in last 12 months uses it.
- Should extra info for ME/PS be included?
 - ⊗ No: generic information content is not yet established, everyone is trying new/different things. Still need max. freedom.
- Requests for a specified file format, -- but fear that forcing such a format would limit users.
 - ⊗ Tevatron uses FNAL MCFIO
 - ⊗ CERN MCDB using XML-like text files.

LHAPDF (structure functions)

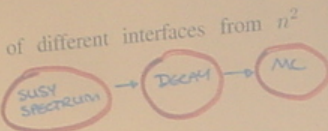
- fewer users.
- evolves PDFs ... no long lookup tables
- Includes code==maintenance
 - ⊗ To be moved to Durham, maintained by Mike Whalley
- To do:
 - ⊗ Need to allow possibility of having many PDFs in memory at one time, to facilitate use of PDFs with uncertainties.
 - ⊗ Need access to:
 - $\Lambda_s, \Lambda_0, c_{\text{threshold}}, b_{\text{threshold}}, Q_{\text{min}}, x_{\text{min}}$
 - ⊗ allow for $p \rightarrow \gamma$ (need to include evolution)
 - ⊗ and other beam particles, π, \dots
 - ⊗ Other smaller changes.
 - Map author strings onto integer
 - ⊗ Try to make everything backwards compatible.
- J. Huston to coordinate.



OKS

Les Houches Discord

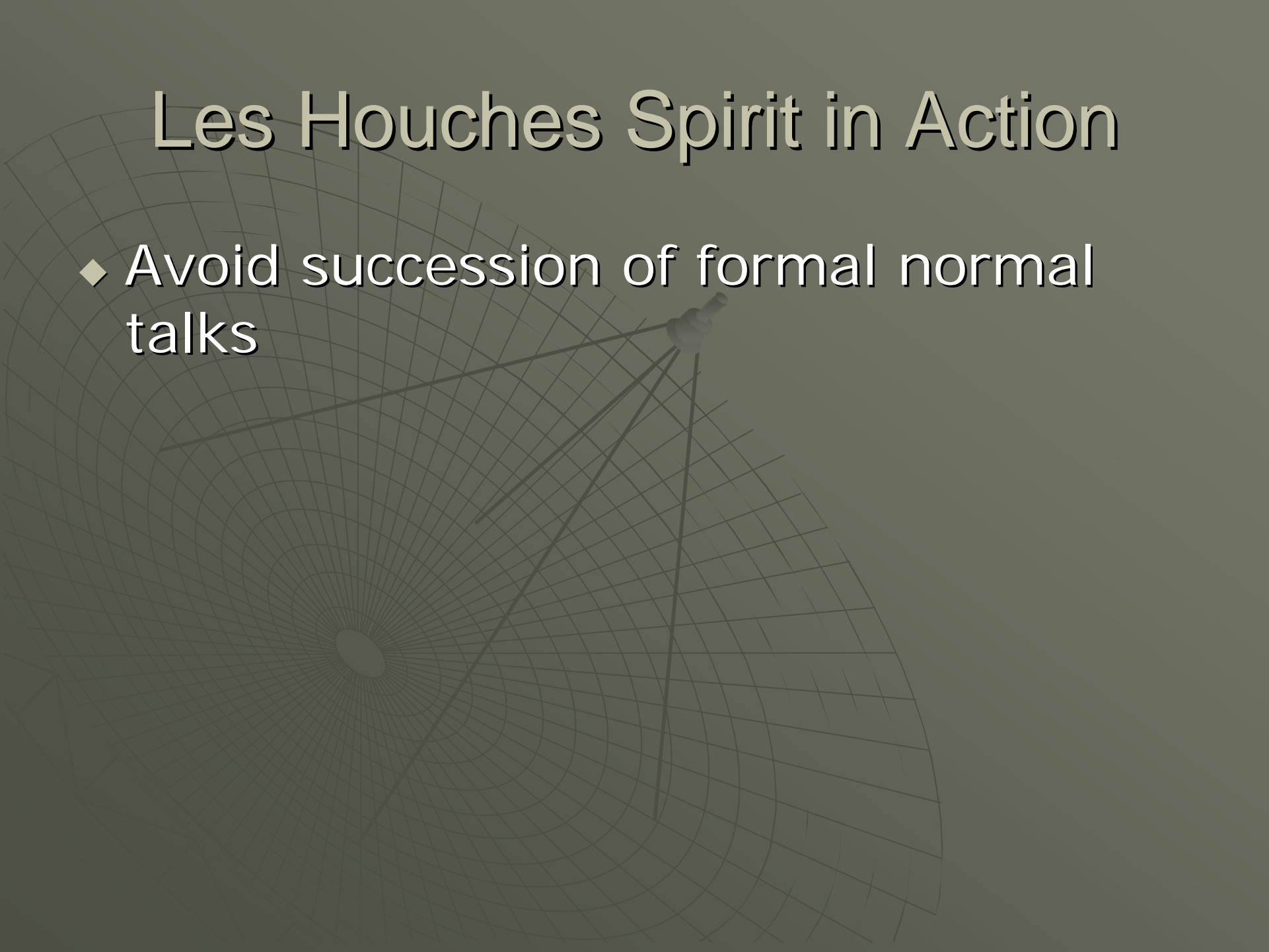
- Les Houches 2001 accord between matrix element generators, Monte-Carlo programs
- Idea is to set same thing up between SUSY spectrum generators and other programs (co-ordinator: P Skands)
- Reduces number of different interfaces from n^2 problem to n
- long discussions
- At Les Houches 2003, then implemented one simple case (CMSSM); it **threw up** problems in the interface design
- Design principles: general structure which can be extended, conventions for particular case etc., *higher loops* very thorny



JUN 6 2003

Les Houches Spirit in Action

- ◆ Avoid succession of formal normal talks









MAY 31 2001

June 12, Session I, start

8.45-9.00 Welcome, the organisers

9.00-9.45 Status Report of the NLO Multileg Working Group, the conveners

9.45-10.30 Status Report of the SM Handles and Candles Working Group, the conveners

Coffee Break

11.00-11.45 Status Report of the SUSY Working Group, the conveners

11.45-12.15 Generators Issues, P. Richardson/ Peter Skands

Lunch

Day

WG 1

WG 2

WG 3

Tue 12

Auditorium: Session I , start

- 8.45-9.00 Welcome, the organisers
- 9.00-9.45 Status Report of the NLO Multileg Working Group, the conveners
- 9.45-10.30 Status Report of the SM Handles and Candles Working Group, the conveners
- Coffee Break
- 11.00-11.45 Status Report of the SUSY Working Group, the conveners
- 11.45-12.15 Generator Issues, P. Richardson
- Lunch

What follows is just what's planned for the main auditorium, so far mostly SMHC, Tools/MC and some NLO.

14:00 (Aud) **WG 1 + MC** : concentrate on NLO and MC issues including

- Output of NLO calculations (stand-alone use or interface to parton showers)
- SCET, BFKL, ...
- Getting control of parton shower uncertainties (+ NLL parton showers?)
- MC tuning in the presence of matching
- Important LHC tests. Wish list of measurements?

14:00 (Library) **WG2 Brainstorm**: SM Handles and Candles. Jets, Min-Bias and Underlying Event, High-lumi issues, Early Running Physics Benchmarks, Electroweak corrections, Parton Distributions, Higgs, Top physics, + suggestions welcome.

14:00 **WG3 Brainstorm** (Amis de La Nature 1) Those who have proposals for discussions should speak for 5 min in front of blackboard. No transparencies at this time, please. The subjects which have critical mass will be identified and discussions on these topics will be scheduled later in the week.

16:30 **NLO Wishlist** (Aud) : progress/additions

- 
- ◆ Programme and Planning updated daily, see the board in the entrance hall, outside the auditorium

All with blackboard, video proj

◆ At the Centre

- Auditorium ~ 70
- QCD Room ~ 15
- Library ~ 20

◆ Amis de la nature

- AdN 1 ~ 30-35
- AdN 2 ~ 20

Victim of our won success

Apologies for split between centre and Amis de la nature

In 1999 about 65 participants over 12 days

2001 -> 85, 12 days

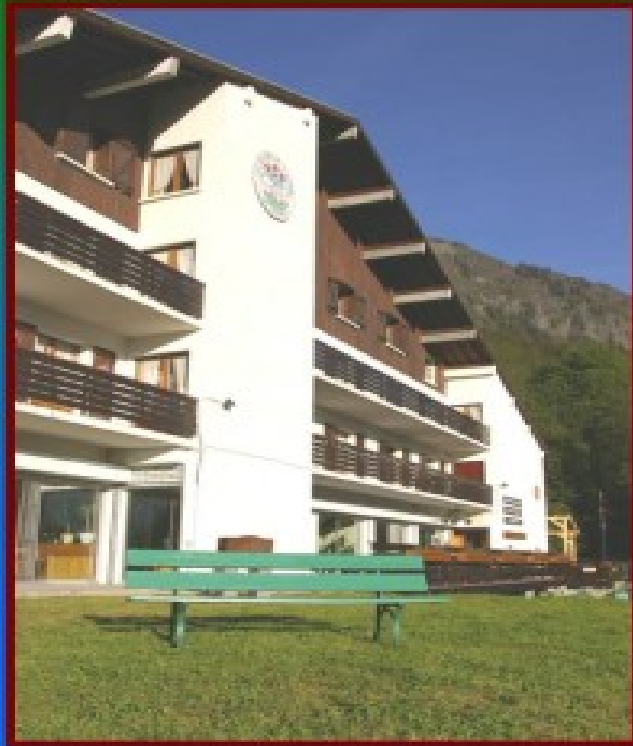
2003 → ~100

2005, 2 sessions 170 people

2007, more than 300 applications!

could not accommodate everyone, two sites,

Amis de la Nature



Food



- 
- ◆ Today 18.30 Welcome Drink
 - The Centre Restaurant/Cafeteria
 - ◆ Friday Workshop Dinner
 - Amis de la Nature
 - ◆ Thursday, Savoyard Dinner, *Tartiflette*

Local Organisers: who to contact?

- ◆ Computing, computers, printers: Jean Philippe Guillet, Rémi Lafaye
 - But read the leaflet and don't expect a superfast internet connection, though speed was quite yesterday evening....
- ◆ Reservation of video projectors, (slide projectors) Seminar Room allocation: Eric Pilon, FB
- ◆ EU matters: Geneviève Bélanger
- ◆ Climbing, hiking, walks, maps: JPG
- ◆ Cycling: EP
- ◆ Please inform at least one of the organisers, let them know where you are going, fill the book in the hall, give approximate time of when you'll be back

Secretariat, coffee breaks, restaurant

- ◆ Secretariat: fees, accommodation issues
 - Open from 8.45-12.30 & 13.30-17.30 (closed week end)
- Ladies more cooperative after 'hello', a smile, 'please'...
- If in the centre, Please fill in the info sheet and hand in to the secretariat
 - Please pay your fees (non EU support)
- ◆ Coffee and tea breaks: please wash your cups
 - Soda and espresso not free, write your name on the list, settle bill before departure

RESTAURANT

- Lunch: 12h30 **sharp**
coffee after lunch @ bar below the restaurant
- Dinner: 19.30 **sharp**
bar open after dinner

enjoy **local** wine to make new friends!

Have a nice Workshop!!

