



QCD Working Group Goals...and welcome

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Michigan State University

First Meeting 16 - 18 Sept. '04 Fermilab • Midterm meetings at Brookhaven & CERN • Final meeting at Fermilab, Fall '05

TeV LHC WORKSHOP



*Using the data & experience
from the Tevatron
to prepare for the LHC*

TeV LHC Organizing Committee:
Georges Azaelos (U. Montreal)
Ulrich Baur (SUNY at Buffalo)
Marcela Carena, Chair (FNAL)
Sally Dawson (BNL)
Dan Green (FNAL)
Ian Hinchliffe (LBL)
Young-Kee Kim (U. Chicago)
Joe Lykken (FNAL)
Stephen Mrenna (FNAL)
Heidi Schellman (Northwestern)
John Womersley (FNAL)

Working Groups
QCD, Top & Electroweak Physics,
Higgs, and Physics Landscape.

Contacts: Cynthia M. Sazama (FNAL)
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Information & Registration: <http://conferences.fnal.gov/tev4lhc/>



TeV4LHC goals



- First of all, this is also a TeV4TeV workshop
- Essentially everything we're doing here is useful/necessary for understanding and exploiting the Tevatron Run II data

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WORKSHOP

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Physics,
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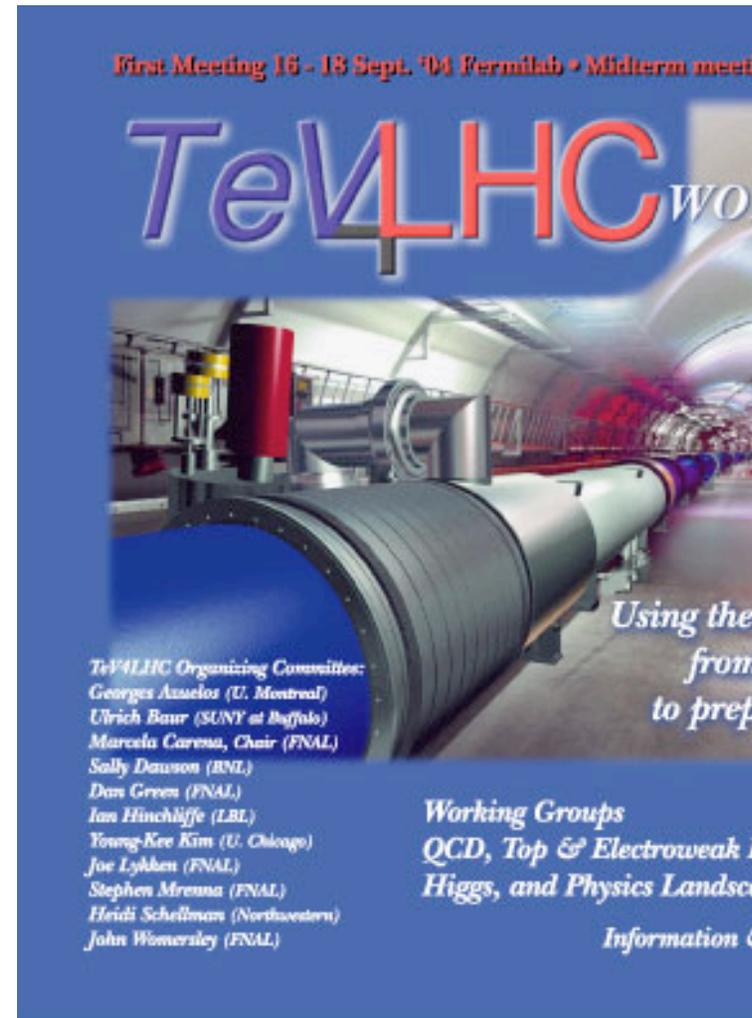
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TeV4LHC goals



- But of course, what we learn at the Tevatron is also useful for the LHC
 - ◆ the Tevatron is the only place to gain hands-on experience in hadron-hadron collider physics
- And the LHC experimenters is us
 - ◆ we can get credit for the LHC doing what we need for the Tevatron
 - ◆ I assume that's one of the reasons for > 200 registrants





QCD group



- Most of the tools we want to produce/develop in this workshop are QCD-related
 - ◆ ME/MC generation
 - ◆ NLO
 - ◆ jet algorithms
 - ◆ pdf's and pdf uncertainties
 - ◆ ...
- I don't even know why people are going to the other groups

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Divided into 2 subgroups



- PDF's and event classification
 - ◆ pdf uncertainties and efficient use in analyses/calculations
 - ▲ why aren't you using LHAPDF?
 - ◆ impact of Tevatron data on global pdf fits
 - ◆ jet algorithms, both cone and k_T
 - ▲ are theorists and experimentalists looking at the same thing?
 - ▲ are experimentalists really looking at what they think they're looking at?
- Hard scattering and hadronization
 - ◆ testing of matrix element-parton showering matching
 - ▲ CKKW
 - ▲ MLM
 - ◆ comparisons to NLO where available
 - ▲ *validation* of matching
 - ◆ pilot studies with MCatNLO
 - ◆ testing new parton shower approaches
 - ◆ underlying event tunes and model development
 - ▲ extrapolations to LHC
 - ◆ hadronization corrections
 - ▲ crucial for NLO comparisons



This meeting is an introduction



- Go over groundwork/issues
- Form smaller interest/working groups that will focus on specific problems
- Note that there have been a series of previous meetings dealing with these types of issues for Run 2
 - ◆ cepa.fnal.gov/patriot/mc4run2/index.html
 - ◆ we will build on that experience



Some overall goals



1. Gauging the importance of Tevatron data for pdf's at the LHC
understanding how important LHC data may be
2. Maximizing the impact of the Tevatron data; are there any measurements we're missing?
3. Understanding theoretical errors on cross sections derived from pdf's and how to reduce them
4. Understanding range of validity for NLO DGLAP (at Tevatron and LHC)
5. Improvements to jet measurements, both theoretical and experimental
alterations to jet algorithm accords



Some overall goals



5. Documenting how well MC's predict specific observables at the Tevatron and finding the impact on LHC predictions
6. Comparing ME-PS matched predictions to Tevatron data and to NLO predictions
 - understanding what HO corrections may be in CKKW?
7. Improving Tevatron tunes for both underlying event and fragmentation
 - persuading Herwig authors to improve their UE model



Some other workshops



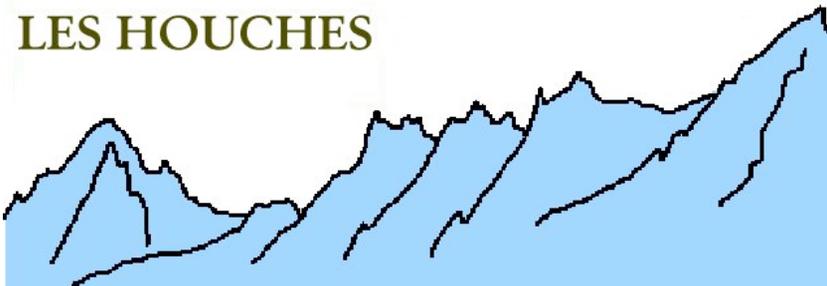
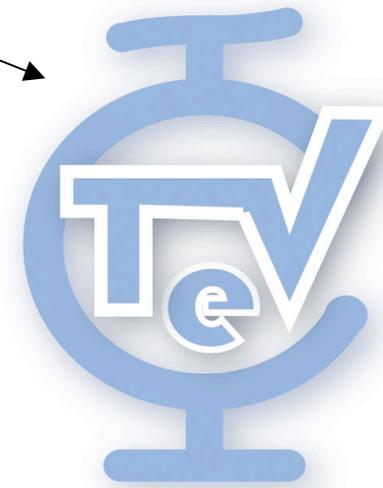
- Physics at TeV Colliders

- ◆ From 800 pb⁻¹ at the Tevatron to 30 fb⁻¹ at the LHC
- ◆ May 2-20

- 2 main working groups

- ◆ SM and Higgs
- ◆ BSM and Higgs modeling

note catchy new logo seen for the first time in public here





Agenda



● THURSDAY 09/16/04 2 PM WH1W

Welcome and Goals

Joey Huston 10 min

Issues in PDFs

Wu-Ki Tung 30 min [pdf](#)

Issues in Jet Algorithms

Stephen Ellis 30 min [pdf](#)

Underlying Event Tunes

Rick Field 25 min [pdf](#) [ppt](#)

Possible Improvements in UE models

Michael Seymour 25 min

4:00-4:30pm Coffee

MC Tuning from TeV to LHC

Markus Wobisch 20 min

4:50-6:30pm General Discussion

● FRIDAY 09/17/04 1:30 PM WH1W QCD-Top/EW Joint

NLO+PS

Bryan Webber 30 min

CKKW Studies

Frank Krauss 20 min

Experience with Matched Samples

Ben Cooper 15 min

Top Monte Carlo

Un-Ki Yang 20 min

B-Tagging Issues

Flera Rizatdinova 30 min

3:30-5:15pm Wine and Cheese

pT-ordered Pythia

Stephen Mrenna 20 min

5:35-6:30pm Additional Discussion