

**WELCOME**  
to the 2011 Pisa workshop on jet  
spectroscopy

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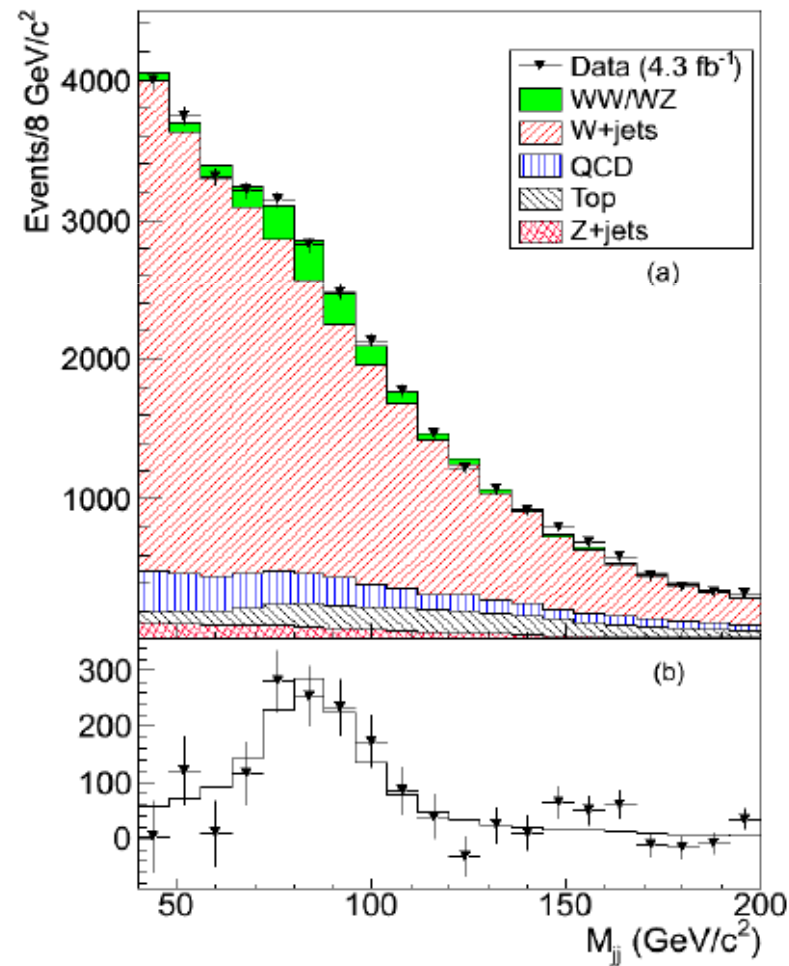
# Apologies for being absent

# A stronger effort on jets is needed

Branching ratios into jets of states with  $M > M_Z$   
may become dominant at very large  $M$

# First Observation of Vector Boson Pairs in a Hadronic Final State at the Tevatron Collider (CDF)

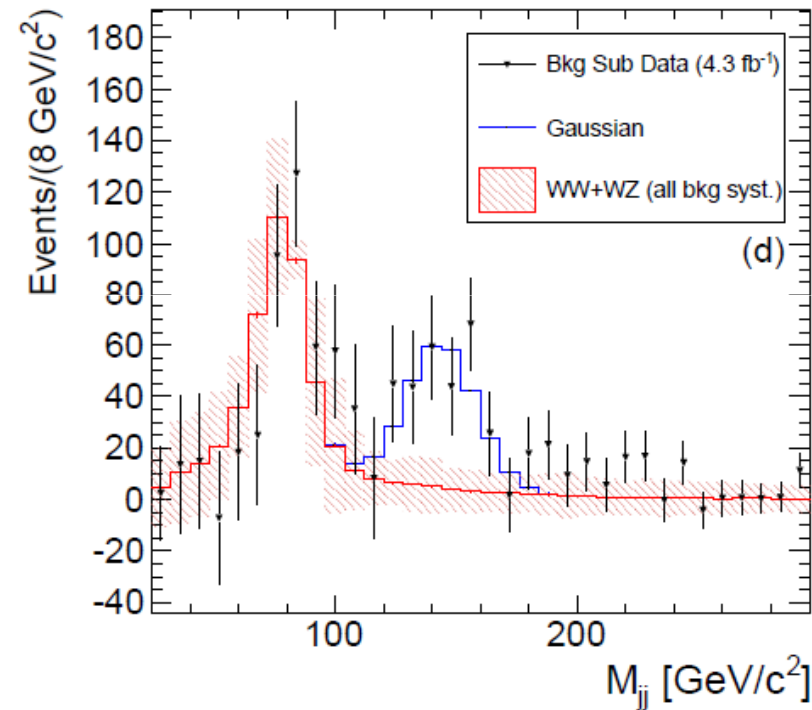
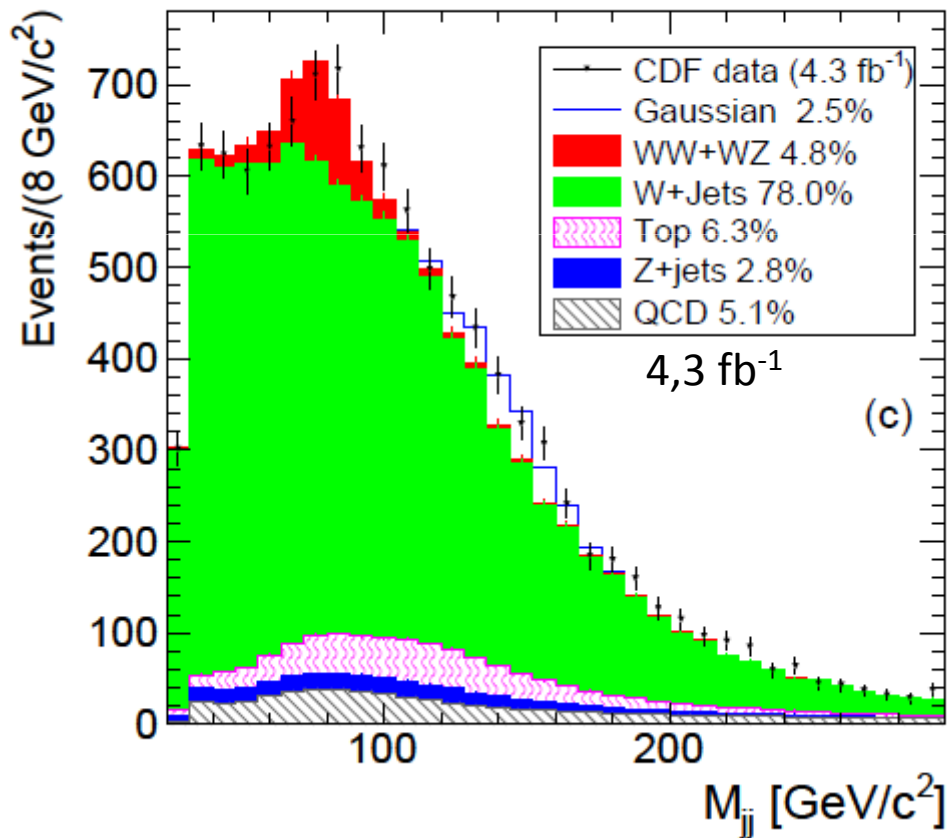
Events with large  $E_{t, \text{miss}}$  and two jets



W and Z  
overlap in the  
spectrum

# Invariant Mass Distribution of Jet Pairs Produced in Association with a W boson in pp Collisions at $\sqrt{s} = 1.96$ TeV (CDF)

Events with a leptonic W and two jets



Study of the new wide bump will be confused by the large background

# Jet energy resolution is not enough

- A new state may decay into light quark jets, s-jets, c-jets, b-jets.
- Background jets have their own flavor composition. S/B will depend on flavor. Tagging of any jet flavor would minimize the physical background.
- Jet energy calibration should be flavor-specific for optimal signal resolution.

# The role of theory

- Theory input is vital for interpreting the kinematical structure of multi-jet states
- For tagging jet flavor one must measure and interpret their fragmentation properties. This is a mixed job for theory and experiments.

# Looking forward

Jet spectroscopy is difficult but potentially very fruitful. Let`s not give up.

Best wishes to you for a pleasant stay in Pisa and for a productive workshop