Particle Physics
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I N V I T A T I O N

as part of the Particle Physics Seminar

to the talk by

Giulia MARINELLI

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on

"From scales to shapes: theory uncertainties with theory nuisance parameters in the Drell-Yan qT spectrum"

Abstract:

Recent measurements have reached sub-percent accuracy, opening the door to detailed studies of theoretical inputs that are crucial within the Standard Model.
Given this level of precision — and the fact that an accurate description of the qT spectrum involves many different theoretical ingredients — a robust treatment of theoretical predictions and their associated uncertainties is essential.
Among these, perturbative uncertainties remain dominant and are traditionally estimated via scale variations. However, this method has well-known limitations.
In this talk, I will present a novel approach based on *theory nuisance parameters* (TNPs) to quantify such uncertainties.
This method properly accounts for theoretical correlations and enables the data itself to constrain, and potentially reduce, these uncertainties in a consistent way.
To illustrate the potential of this framework, I will discuss an ongoing project involving the extraction of alphas(mZ) and its uncertainty using fits to pseudodata, analyzing both perturbative and non-perturbative uncertainties.
Although this study does not yet include other subdominant sources of theoretical uncertainty, which will be addressed in future extractions of alphas(mZ) from real experimental data, I will briefly comment on the recent CMS mW determination, which successfully employed TNPs as part of its uncertainty modeling.

Time: Tuesday, 29 April 2025, 4:15 p.m.

Location: Erwin-Schrödinger Lecture Hall, 1090 Vienna, Boltzmanngasse 5, 5th floor

Join Zoom Meeting - Meeting ID: 933 4269 3866 Passcode: 185096
https://univienna.zoom.us/j/93342693866?pwd=aUpTR0VJNUhJY2Q0ajdaKzI1YWVBQT09

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