

S E M I N A R



Ass. Prof Raoul Röntsch
University of Milan, Italy, and INFN Milan

Date:

Tuesday, 18 March 2025

Time:

13h15-14h15 SAST

Venues:

- P213, Physics Building, East Campus, WITS
- Online

Who should attend?

All are welcome!

Enquiries:

Email Farah-Naaz Samuels:
farah-naaz.samuels@wits.ac.za

Precision physics at the Large Hadron Collider

ABSTRACT:

The large and ever-increasing dataset from the Large Hadron Collider (LHC) offers an ideal opportunity to both improve our understanding of the Standard Model (SM) of particle physics -- and in particular of the Higgs boson that plays a key role in it -- and to stress-test the SM in search of physics beyond it. To match experimental accuracy and make full use of the data obtained, we require high-precision theoretical predictions. I will discuss the motivations behind such predictions in more depth, before describing the necessary calculations and the principles underlying them. I will illustrate some of the challenges that arise when performing these calculations, and some of the methods for overcoming these obstacles. I will conclude by highlighting some state-of-the-art results. I will try to make the talk accessible to non-experts; and hope that students at honours or masters level can follow it.

Raoul Röntsch obtained his BSc (Hons.) and MSc at the University of Cape Town, before earning his doctorate in Theoretical Physics at the University of Oxford in 2012. He subsequently held postdoctoral positions at Fermilab in the USA (2012-2015) and Karlsruhe Institute of Technology in Germany (2015-2018), before becoming a Fellow in the Theoretical Physics Department at CERN in 2018. In 2021, he was appointed associate professor at the University of Milan. The focus of his research is the development of methods to perform calculations in perturbative quantum chromodynamics, and the application of those methods to make high-precision predictions for phenomenology at the Large Hadron Collider, with particular emphasis on the physics of the Higgs boson.

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