

# UM Physics Department

## Miami 2020 Physics Conference (Online)

**Name:** Wolfgang Wagner

**Title:** Recent highlights on top-quark physics with the ATLAS detector

**Abstract:**

Highlights of recent measurements on top-quarks physics performed by the ATLAS Collaboration are presented. At the Large Hadron Collider top-quarks are copiously produced, allowing for detailed studies of the production processes by measuring differential and even double-differential cross-sections of top-quark-antiquark pair production. These measurements can be used to compare to fixed-order predictions at the highest available precision, predictions by different Monte Carlo generator setups, the extraction of the top-quark mass or for further constraining parton distribution functions. Another focus of recent analyses is the study of rare production processes, such as the production of a top-quark-antiquark pair in association with a gauge boson. Recent measurements of top-quark-antiquark production in association with a high- $p_T$  photon or a Z boson are discussed. An exciting new result is the evidence for the simultaneous production of two top-quark-antiquark pairs, called four-top-quark production. This process is very rare with a cross-section five orders of magnitude smaller than the leading top-quark-antiquark production process.