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### Higgs from top to bottom

*Discovery of the Higgs boson coupling to top quarks with the ATLAS detector*

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**Publication date**

2018

**Document Version**

Other version

**License**

Other

[Link to publication](#)

**Citation for published version (APA):**

Wolf, T. M. H. (2018). *Higgs from top to bottom: Discovery of the Higgs boson coupling to top quarks with the ATLAS detector*.

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## Stellingen

behorende bij het proefschrift

# Higgs from top to bottom

Discovery of the Higgs boson coupling to top quarks with the ATLAS detector

door

**TIM MICHAEL HEINZ WOLF**

1. The Standard Model of Particle Physics provides accurate and precise predictions for many different kinds of phenomena in collider physics.
2. The coupling of the top quark to the Higgs boson has been established.
3. The analysis of top quark pair production together with a Higgs boson decaying into  $b\bar{b}$  would benefit from more precise and accurate predictions of the background  $t\bar{t}b\bar{b}$ .
4. The growing amount of data collected by ATLAS sets higher demands on the size of the Monte Carlo statistics of the simulated samples.
5. The hunt for new physics at the LHC through direct searches is not over. However, precision measurements become more important in the future.
6. Machine learning techniques have growing importance in the academic and non-academic world.
7. Leading and guiding people in a large collaboration is an important and underestimated skill.
8. A transparent management structure is beneficial to increase acceptance of inner-political decisions of an experimental collaboration.
9. Life has many interesting subjects and aspects to offer. The claim of never being able to change subject is usually premature.
10. Big collaborations like ATLAS prepare young scientists for a highly competitive working environment in their future, possibly outside academia.
11. Time will tell.