J.T.S. Yue

**Higgs Properties at the LHC**

Implications for the Standard Model and for Cosmology

Series: Springer Theses

- Nominated as an outstanding PhD thesis by the University of Sydney, New South Wales, Australia
- Derives new constraints for CP-violating Higgs-top quark Yukawa coupling
- Explores implications for early universe phase transitions and matter–antimatter asymmetry

This thesis studies the properties of the Higgs particle, discovered at the Large Hadron Collider (LHC) in 2012, in order to elucidate its role in electroweak symmetry breaking and cosmological phase transition in the early universe. It shows that a generic spin-2 Higgs impostor is excluded by the precision measurements of electroweak observables and perturbative unitarity considerations. It obtains LHC constraints on anomalous CP-violating Higgs-Top Yukawa couplings and examines the prospects of their measurement in future experiments. Lastly, it discusses in detail the electroweak phase transition and generation of cosmological matter–antimatter asymmetry in the universe with anomalous Higgs couplings.