

# Abstract

In this thesis we present two different studies of non-Abelian gauge theories applied to Beyond the Standard Model physics. The first is a non-perturbative analysis, performed with lattice techniques, of an  $SU(2)$  gauge theory with fundamental fermion and scalar fields. The results of this study are relevant in the context of composite Higgs models based on the recently proposed mechanism of fundamental partial compositeness. The second study concerns the transport coefficients of gauge theories featuring large-distance conformality. This study addresses the important topic of the thermodynamic properties of theories in the conformal window, and inspects how reliable perturbative results for transport coefficients are for this class of theories.