<div align="center">

論文の内容の要旨

</div>

論文題目　Inflation in Supergravity with a Single Superfield
（超重力理論における単一の超場によるインフレーション）

氏 名　寺 田　隆 広

　　Supergravity is a well-motivated theory beyond the standard model of particle physics, and a suitable arena to study high-energy physics at the early universe including inflation, whose observational evidences are growing more and more.　Inflation in supergravity, however, can not be trivially described because of restrictions from supersymmetry. The scalar potential has an exponential factor and a large negative term whereas a flat and positive potential is needed to realize inflation.　The standard method to obtain a suitable inflationary scalar potential requires an additional superfield to the one containing inflaton.　In this thesis, we propose and develop an alternative method which does not require the additional superfield and thus reduces the necessary degrees of freedom by half.　That is, we study inflation in supergravity with only a single chiral superfield which contains inflaton.　We accomplish it by introducing a higher dimensional term in the inflaton Kähler potential, which plays an important dual role: fixing the value of the scalar superpartner of the inflaton resulting in effective single field models, and ensuring the positivity of the inflaton potential at the large field region.　Our proposal is not just particular models but rather a new framework to realize various inflationary models in supergravity.　In particular, large field inflation in supergravity using one superfield without tuning has become possible for the first time.　In our generic models, supersymmetry breaking at the inflationary scale by inflaton is not completely restored after inflation, so null results for supersymmetry search at the LHC are predicted for the simplest cases.　Remarkably, however, it is possible with tuning to embed arbitrary positive semidefinite scalar potentials into supergravity preserving supersymmetry at the vacuum.　Our discovery opens up an entirely new branch of model building of inflation in supergravity.