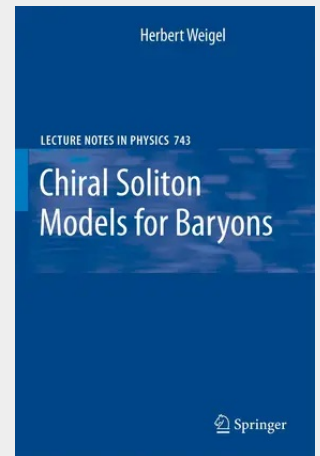


## Chiral Soliton Models for Baryons

This concise research monograph introduces and reviews the concept of chiral soliton models for baryons. In these models, baryons emerge as (topological) defects of the chiral field. The many applications shed light on a number of baryon properties, ranging from static properties via nuclear resonances to even heavy ion collisions. This volume also features a number of appendices to help nonspecialist readers to follow in more detail some of the calculations in the main text.

The purpose of this monograph is to explain and review the chiral soliton picture for baryons and their low-energy properties. Even though this picture by now ages almost half a century, it is currently more than ever under intense investigation. Various revivals have let the model stay modern. Examples that initiated renewed interest are the quark spin contribution to the nucleon spin ("proton spin puzzle") or the quest for pentaquarks and other exotic baryons. Various motivations for soliton models can be thought of. Mostly they relate to the observed flavor and chiral symmetries of strong interactions and properties of quantum chromodynamics (QCD) when it is generalized to contain infinitely many color degrees of freedom. The author is fully aware that there is nothing but an inevitable derivation of the soliton picture from QCD. This probably is a common characteristic of any model attempting to describe baryon properties at low energies. Chiral soliton models certainly do have their limitations. However, they definitely possess a degree of straightforwardness uncommon to other models for hadrons. It is the author's hope that the reader will appreciate the attractive beauty resulting thereof. Quite a number of arguments and conclusions presented in this monograph reflect the author's personal opinion. Yet, the interested reader should be able to gain an objective point of view from the comprehensive list of references that is included. There are actually many variants of soliton models on the market: starting from the famous Skyrme model of pion fields via vector meson extensions to bosonized formulations of the quark flavor dynamics.



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