

Addendum

Condensed Matter Physics

A. Pruisken

**Exact Haldane Mapping for All S and Super
Universality in Spin Chains**

Univ. of Amsterdam

E. Kulatov, A. Titov, and Yu. Uspenskii

**First-Principles Calculations of Materials
Perspective for Nanoelectronics**

Lebedev Inst., Moscow

High-Energy Physics

A. Andrianov, V. Andrianov, and D. Espriu

Spontaneous Parity Violation in Hot and Dense Baryon Matter in QCD Motivated Hadronic Models

We investigate the possibility of parity being spontaneously violated in QCD at finite baryon density and temperature. QCD is approximated by a generalized sigma model with two isomultiplets of scalars and pseudoscalars. The interaction with the chemical potential is introduced via the coupling to constituent quark fields. This mechanism of parity violation is based on interplay between lightest and heavier meson condensates. We argue that, in the appropriate environment (dense and hot nuclear matter of a few normal densities and not so high temperatures), parity violation may be the rule rather than the exception, its occurrence is well compatible with the existence of stable bound state of normal nuclear matter and it may well interfere with other more exotic phases like quarkyonic, 2SC or CFL.

Univ. of Barcelona, ICCUB & Petersburg Univ.
andrianov@bo.infn.it

Quantum Field Theory

F. Spill

Yangian Doubles of Lie Superalgebras and Their R-Matrices

Yangians of type $psu(2, 2|4)$, $osp(6|4)$ and (centrally extended) $psu(2|2)$ and their R-matrices in various representations play an important role in the AdS/CFT correspondence. We obtain the universal R-matrices for the Yangians of $gl(n|m)$ for all n, m . These are representation independent and can hence be used to for all representations by evaluating the obtained expression for the universal R-matrix.

Imperial College London

`fabian.spill@imperial.ac.uk`

Quantum Gravity and Cosmology

V. Rubakov

**Towards a Consistent Theory of Massive
Spin-2 Field of Geometric Origin**

Inst. for Nuclear Research, Moscow

Superstrings and Higher Spin Gauge Theory

V. Kazakov

Towards the Full Exact Spectrum of Planar AdS/CFT

We propose a set of functional equations for the exact spectrum of anomalous dimensions of all operators of the planar $N = 4$ super-Yang-Mills theory at any strength of the gauge coupling. The duality of this 4-dimensional conformal gauge theory to the integrable Metsaev-Tseytlin superstring sigma model recently allowed us to apply the thermodynamical Bethe ansatz (TBA) framework and to construct the full set of TBA equations and the corresponding Y-system. These TBA equations generalize the asymptotic Bethe ansatz approach of Beisert-Eden-Staudacher, valid only for long operators, to any short operators, including the most interesting ones, like Konishi operator. A possibility of numerical solution of these equations is discussed

Ecole Normale Supérieure & Univ. Paris VI