ACHT 2020: Perspectives in Particle, Cosmo- and Astroparticle Theory

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Book of Abstracts

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Quark masses and mixings from a minimal parameterisation of new physics

Author: Reinhard Alkofer[1]

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The simplest possible parameterisation of new physics that results in an ultraviolet complete gauge-Yukawa sector of the Standard Model is explored. It is investigated what constraints are implied for the values of quark masses and mixings at the electroweak scale.

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Black Holes with Pressure

Author: Tamas Sandor Biro[1]

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We reconsider black hole thermodynamics by assuming a pressure and volume term doing work. This makes the entropy extensive and different views of a possible volume will be listed. The result continues for rotating and electrically charged horizons.

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(To be announced)

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TBA

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From small to large systems in the non-extensive statistical approach

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TBA

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New exact solutions of relativistic viscous hydrodynamics

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The presentation will be an updated version of my talk at the 2019 Zimanyi Winter School on Relativistic Heavy Collisions, December 2019 in Budapest, the earlier version is available at

https://indico.cern.ch/event/867085/contributions/3656168/

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(To be announced)

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TBA

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Order of the color superconducting phase transition

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Using the functional renormalization group method, I will discuss the order of the color superconducting phase transition. The Ginzburg-Landau theory of color superconductivity will be compared to that of ordinary superconductivity, and it will be argued that while the latter model allows for both first and second order transitions, gluonic fluctuation effects are more dominant than that of the photon, and thus in the former theory only first order transition is a legitimate possibility.

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Glueballs from functional methods

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Results for the ground states and excited states of scalar and pseudoscalar glueballs in Yang-Mills theory from Bethe-Salpeter equations are presented. The input comes from Dyson-Schwinger calculations of the propagators and vertices which are obtained from a parameter-free calculation. Both the gauge-variant correlation functions and the glueball masses are in good quantitative agreement with lattice data. For the scalar and pseudoscalar glueball ground states we obtain 1.8 GeV and 2.4 GeV and for the first excited states 2.4 GeV and 3.5 GeV, respectively.

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π^0 transition form factor in Minkowski and Euclidean Space using quark propagator Ansätze

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TBA

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Insights into hadron structure from deeply virtual Compton scattering

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TBA

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(To be announced)

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TBA

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FRG-treatment of U_A(1) symmetry restoration

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(to be submitted later)

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(To be announced)

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(To be announced)

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The double charm meson-meson molecules

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TBA