

## XIII International Conference

### SELECTED PROBLEMS OF MODERN THEORETICAL PHYSICS

**Bogoliubov Laboratory of Theoretical Physics, Dubna, Russia, June 23-27, 2008**

#### Second Bulletin

The Organizing Committee received more than 150 applications for the talks. About 120 talks were selected for presentation during the working days of the Conference, June 23-27. The program will include plenary talks (40 min) and talks to be given in several sections: Modern Mathematical Physics, Gravity and Cosmology, Quantum Theory (general problems of quantum theory), Quantum Field Theory, QCD I, QCD II, QCD III, Hadronic Matter at Finite Density and Temperature. Presentations related to the theory of strong interactions are divided into three groups: QCD I - confinement, chiral symmetry, lattice QCD; QCD II - structure of hadrons, generalized and spin distribution functions, deep inelastic scattering; QCD III - quark models, heavy quark physics, phenomenology of strong interactions. There will be extended (30 min) and regular (20 min) section talks.

Please **confirm your participation** in the Conference as soon as possible. Please check the correctness of the titles in the preliminary program, and let us know if the date scheduled for your talk is inconvenient for you.

The **deadline** for suggestions and corrections is **June 1, 2008**.

The **arrival** day is June 22, **departure** – June 28. Please inform the Organizing committee about the actual time of your arrival/departure. Participants arriving at Moscow airports should give us the **detailed information about the flights**. Transportation from the airports to Dubna and back will be organized.

**Conference fee** is expected to be paid in cash at registration. Registration will take place on Sunday, June 22 (hotel «Dubna»), and on June, 23 (Bogoliubov Laboratory of Theoretical Physics).

**Proceedings** of the Conference will be published by JINR Publishing department. The rules for preparation of contributions will be announced later.

## Preliminary Program

|              | 23.06 Mo                    | 24.06 Tu                              | 25.06 We                 | 26.06 Th                   | 27.06 Fr                |
|--------------|-----------------------------|---------------------------------------|--------------------------|----------------------------|-------------------------|
| <i>Chair</i> |                             |                                       |                          |                            |                         |
| 09.00        | Registration                | Simonov                               | Arefeva                  | Kataev                     | Achasov                 |
| 09.30        | Sissakian                   |                                       |                          |                            |                         |
| 09.40        |                             | Reinhardt                             | Faddeev                  | Zakharov                   | Efremov                 |
| 10.00        | Slavnov                     |                                       |                          |                            |                         |
| 10.20        |                             | Von Smekal                            | Di Giacomo               | Minkowski                  | Stefanis                |
| 10.40        | Zoupanos                    |                                       |                          |                            |                         |
| <b>11.00</b> | <i>Coffee break (11.20)</i> | <i>Coffee break</i>                   | <i>Coffee break</i>      | <i>Coffee break</i>        | <i>Coffee break</i>     |
| <b>11.30</b> |                             |                                       |                          |                            |                         |
| <i>Chair</i> |                             |                                       |                          |                            |                         |
| 11.30        | Sorin (11.40)               | Muller-Prussker                       | Kleinert                 | Lipatov                    | Vasiliev                |
| 12.10        | Aksenov (12.20)             | Polikarpov                            | Ivanov                   | Kazakov                    | Filippov                |
| 12.50        |                             |                                       |                          |                            | Starobinsky             |
| <b>14.30</b> | <i>Lunch (13.00 –14.30)</i> | <i>Lunch</i>                          | <i>Lunch</i>             | <i>Lunch</i>               | <i>Closing (13.30)</i>  |
|              |                             |                                       |                          |                            | <i>Farewell (14.00)</i> |
|              | <i>Parallel Sessions</i>    | <i>Parallel Sessions</i>              | <i>Parallel Sessions</i> | <i>Parallel Sessions</i>   |                         |
| 14.30        | QCD II                      | QCD III                               | QCD I                    | QCD III                    |                         |
| 14.30        | Math.Phys.                  | QFT                                   | QCD III                  | Hadronic Matter            |                         |
| 14.30        | Quantum Theory              | Math. Phys                            | Math. Phys               | Gravity&Cosmology          |                         |
| 14.30        | Gravity&Cosmology           | Hadronic Matter                       | QFT                      |                            |                         |
| <b>16.00</b> | <i>Coffee break</i>         | <i>Coffee break</i>                   | <i>Coffee break</i>      | <i>Boat Trip (17.00) /</i> |                         |
| <b>16.30</b> |                             |                                       |                          | <i>Banquet</i>             |                         |
|              | <i>Parallel Sessions</i>    | <i>Memorial Session</i>               | <i>Parallel Sessions</i> |                            |                         |
| 16.30        | QCD II                      | Documentary about<br>D.I. Blokhintsev | QCD I                    |                            |                         |
| 16.30        | Math.Phys.                  |                                       | QCD III                  |                            |                         |
| 16.30        | Quantum Theory              |                                       | MathPhys                 |                            |                         |
| 16.30        | Gravity&Cosmology           |                                       | QFT                      |                            |                         |
| 17.00        |                             | Zrodnikov                             |                          |                            |                         |
| 17.30        |                             | Sukhanov                              |                          |                            |                         |
| 18.00        |                             | Kuzemsky                              |                          |                            |                         |
| 18.30        |                             | Efimov                                |                          |                            |                         |
| <b>19.00</b> | <i>Welcome Party</i>        |                                       |                          |                            |                         |

## Plenary Sessions

### June 23

- 09:30 Sissakian Alexei N.** Opening of the Conference
- 10:00 Slavnov Andrei A.** (Steklov MI RAS, Moscow)  
Gauge invariant infrared regularization of the Yang-Mills theory
- 10:40 Zoupanos Georgios** (CERN)  
Finite Unified Theories and the prediction of the Higgs mass
- 11:40 Sissakian Alexei N., Sorin Alexander S.** (JINR)  
Project of the Nuclotron-based ion collider facility (NICA) at JINR:  
perspectives of heavy ion and spin physics
- 12:20 Aksenov Viktor L.** (JINR&KIAE)  
IBR-2 reactor in research of nanomaterials

### June 24

- 09:00 Simonov Yuri** ITEP, Moscow, Russia  
QCD vacuum structure: confinement and chiral symmetry breaking
- 09:40 Reinhardt Hugo** Institute for Theoretical Physics, Tübingen, Germany  
Yang-Mills Theory in Coulomb Gauge
- 10:20 von Smekal Lorenz** University of Adelaide, Australia  
The Prospect of Comparing Apples with Apples in Landau Gauge  
QCD, Functional Methods versus Lattice Simulations
- 11:30 Muller-Preussker Michael** Humboldt-University Berlin, Germany  
Infrared QCD from the lattice point of view
- 12:10 Polikarpov Mikhail** ITEP, Moscow  
Entanglement entropy for strings and particles on the lattice

### Memorial Session (16:00 – 18-30)

#### Documentary about D.I. Blokhintsev

Zrodnikov F.V. Obninsk

TBA

**Efimov Garii** JINR

D.I. Blokhintsev and nonlocal quantum field theory

**Sukhanov Aleksandr** JINR

Development of Ensemble Approach in Quantum Physics: from Planck to Blokhintsev.

**Kuzemsky Alexander** JINR

The Works of D.I. Blokhintsev on Solid State and Statistical Physics

## June 25

- 9:00 Arefeva Irina** SMI RAS , Russia  
TBA
- 9:40 Faddeev L.D.** (SMI RAS, St. Petersburg)  
Hypothetical knot-like excitations in quantum Yang-Mills theory
- 10:20 Di Giacomo Adriano** Pisa Uni., Italy  
On some features of color confinement
- 11:30 Kleinert Hagen** Inst. f. Theor. Physik, Freie Universität Berlin, Germany  
Multivalued fields
- 12:10 Ivanov Evgeny** JINR  
TBA

## June 26

- 9:00 Kataev Andrei** Moscow, Russia  
Polarized deep inelastic scattering and the quest of light quark flavour asymmetry
- 9:40 Zakharov Valentin** ITEP, Moscow, Russia  
TBA
- 10:20 Minkowski Peter** ITP , University of Bern, Switzerland  
On the class of chiral representations within QCD
- 11:30 Lipatov Lev** St. Petersburg, Russia  
BFKL Pomeron and production amplitudes in N=4 SUSY
- 12:10 Kazakov Dmitri** JINR  
Conformal deformations of N=4 SuperYang-Mills theories

## June 27

- 9:00 Achasov Nikolay** Sobolev IM SB RAS, Novosibirsk  
Light scalar mesons today
- 9:40 Efremov Anatoly** JINR  
Spin physics in QCD
- 10:20 Stefanis Nikolaos** Institute for Theoretical Physics II, Bochum, Germany  
Renormalization-group approach to TMD PDFs in QCD
- 11:30 Vasiliev M.** LPI RAS, Moscow  
TBA
- 12:10 Filippov Alexandre** JINR  
Integrable models of gravity and their application in cosmology
- 12:50 Starobinsky Alexei** Moscow, Russia  
Scalar-tensor and f(R) models of dark energy

## Section Talks

| <i>Name</i>            | <i>Title</i>   | <i>Section</i>      | <i>Duration</i> | <i>Date</i> |
|------------------------|--|---------------------|-----------------|-------------|
| <b>Alekseev G.</b>     | Integrability and monodromy preserving structure of symmetry reduced heterotic string effective equations                            | Math. Phys.         | 20 min          | 25.06       |
| <b>Alexandrov L.</b>   | Numerical approach to analyze globally a given nonlinear problem   | Math. Phys.         | 20 min          | TBA         |
| <b>Andrianov V.</b>    | Parity violation in QCD motivated hadronic models at nonzero baryon densities  | QCD III             | 30 min          | 24.06       |
| <b>Arbuzov A.</b>      | Initial data Higgs effect in Cosmology   | Gravity & Cosmology | 20 min          | 23.06       |
| <b>Arbuzov B.</b>      | Effective interactions in QCD and EW theory due to application of Bogoliubov compensation method                                     | QFT                 | 30 mn           | 24.06       |
| <b>Arnold S.</b>       | Parity-violating spin asymmetries in polarized proton-proton scattering with hadronic final states                                   | QCD II              | 20 min          | 23.06       |
| <b>Bakulev A.</b>      | Polarized mu-pair pion-induced Drell--Yan production and the pion distribution amplitude   | QCD II              | 30 min          | 23.06       |
| <b>Belitsky A.</b>     | Integrability in super-Yang-Mills theories   | Math. Phys.         | 30 min          | 23.06       |
| <b>Berezin V.</b>      | Schroedinger equation in finite differences  | Gravity & Cosmology | 20 min          | 23.06       |
| <b>Blaschke D.</b>     | Color superconducting quark matter   | Hadronic Matter     | 30 min          | 24.06       |
| <b>Bodrova A.</b>      | Diffusion of rough granular particles - the components of Saturn Rings and other astrophysical objects                               | Gravity & Cosmology | 20 min          | 23.06       |
| <b>Bogolubsky I.</b>   | 2D stable topological solitons in the A3M model  | Math.Phys.          | 20 min          | 23.06       |
| <b>Bondarenco M.</b>   | High-energy hadron charge exchange reactions at small scattering angles  | QCD II              | 20 min          | 23.06       |
| <b>Bornyakov V.</b>    | TBA  | QCD I               | 20 min          | 25.06       |
| <b>Boroun G.</b>       | Solutions of DGLAP evolution equations for the gluon and structure function exponents and determination of the Reduced Cross Section | QCD II              | 20 min          | 23.06       |
| <b>Bugaev K.</b>       | On Finite Width of Quark Gluon Plasma Bags   | Hadronic Matter     | 30 min          | 24.06       |
| <b>Bystritskiy Yu.</b> | Radiative decays of pseudoscalar and vector mesons and process $e^+e^-$ to PV  | QCD II              | 20 min          | 23.06       |
| <b>Cucchieri A.</b>    | How to extract information from Green's functions in Landau gauge  | QCD I               | 30 min          | 25.06       |
| <b>Cherednikov I.</b>  | Instanton-induced contributions to the Single-Spin Asymmetries: Sivvers function   | QCD II              | 20 min          | 23.06       |
| <b>Chizhov A.</b>      | Quantum Channel Decoherence in Optics  | Quantum Theory      | 20 min          | 23.06       |
| <b>Chubykalo A.</b>    | Helmholtz theorem and the $v$ -gauge in the problem of superluminal and instantaneous signals in classical electrodynamics           | QFT                 | 20 min          | 25.06       |
| <b>Dimitrov B.</b>     | Physical and Algebraic-Geometry Aspects of Gravitational Theories  | Gravity & Cosmology | 20 min          | 23.06       |

| <i>Name</i>            | <i>Title</i>  | <i>Section</i>      | <i>Duration</i> | <i>Date</i> |
|------------------------|---|---------------------|-----------------|-------------|
| <b>Dorokhov A.</b>     | Rare $\pi$ -to- $e^+e^-$ decay as a filter for low mass dark matter                   | QCD III             | 30 min          | 25.06       |
| <b>Ebert D.</b>        | Dynamical symmetry breaking for quark matter in the static Einstein universe          | Gravity & Cosmology | 30 min          | 26.06       |
| <b>Espinoza G.</b>     | On some unusual properties of wave solutions of free Maxwell equations                | QFT                 | 20 min          | 25.06       |
| <b>Faustov R.</b>      | Properties of heavy hadrons in the relativistic quark model                           | QCD III             | 30 min          | 24.06       |
| <b>Frolov A.</b>       | A singularity problem with $f(R)$ dark energy   | Gravity & Cosmology | 30 min          | 23.06       |
| <b>Galkin V.</b>       | Heavy baryons in the relativistic quark model   | QCD III             | 20 min          | 25.06       |
| <b>Gladyshev A.</b>    | Long-lived superparticles at LHC  | QFT                 | 30 min          | 24.06       |
| <b>Hiller B.</b>       | Impact of eight-quark interactions on chiral phase transitions II: thermal effects    | Hadronic Matter     | 20 min          | 26.06       |
| <b>Isaev A.</b>        | BRST operators for $W$ -algebras  | Math. Phys.         | 30 min          | 23.06       |
| <b>Ivanov D.</b>       | TBA   | QCD II              | 20 min          | TBA         |
| <b>Ivanov M.</b>       | Pion polarizabilities in ChPT   | QCD III             | 20 min          | 25.06       |
| <b>Jenkovszky L.</b>   | Saturation effects in lepton- and hadron-induced reactions at high energies           | QFT                 | 20 min          | TBA         |
| <b>Kisselev A.</b>     | Hadron multiplicity from the top  | QCD III             | 20 min          | 25.06       |
| <b>Klimenko K.</b>     | Masses of mesons and diquarks in color-flavor locked phase of dense quark matter      | Hadronic Matter     | 20 min          | 26.06       |
| <b>Kosyakov B.</b>     | Massless charged and colored particles  | QFT                 | 20 min          | 25.06       |
| <b>Kozlov G.</b>       | BEC of identical and nonidentical particles at finite temperatures                    | Hadronic Matter     | 20 min          | 26.06       |
| <b>Khrushchov V.</b>   | Generalized kinematic symmetries of quantum phase space                               | Math. Phys.         | 20 min          | 23.06       |
| <b>Krykhtin V.</b>     | Gauge invariant Lagrangian formulation of higher spin massive                         | Math. Phys.         | 20 min          | TBA         |
| <b>Khvedelidze A.</b>  | On the entangled spins precession in a strong laser field                             | QFT                 | 20 min          | 25.06       |
| <b>Kalmykov M.</b>     | Special functions and Massive Feynman Diagrams  | QFT                 | 20 min          | 25.06       |
| <b>Kochelev N.</b>     | Nonperturbative mechanism for single spin asymmetries in QCD                          | QCD II              | 20 min          | 23.06       |
| <b>Korobov V.</b>      | Precision spectroscopy and fundamental constants                                      | Quantum Theory      | 20 min          | 23.06       |
| <b>Kotikov A.</b>      | Anomalous dimensions in $N=4$ SUSY  | Math. Phys.         | 30 min          | 23.06       |
| <b>Kulich P.</b>       | Integrable spin chains in quantum computations  | Math. Phys.         | 30 min          | 25.06       |
| <b>Laperashvili L.</b> | Cosmological consequences of the $E(6)$ unification in the ordinary and mirror worlds | Gravity & Cosmology | 20 min          | 23.06       |
| <b>Lavrov P.</b>       | Fedosov and Riemannian supermanifolds   | Math. Phys.         | 20 min          | 25.06       |
| <b>Levai P.</b>        | Could we find quark-gluon plasma in $pp$ collision at LHC?                            | Hadronic Matter     | 30 min          | TBA         |
| <b>Litim D.</b>        | Fixed points of quantum gravity   | Gravity & Cosmology | 20 min          | 23.06       |

| <i>Name</i>              | <i>Title</i>   | <i>Section</i>      | <i>Duration</i> | <i>Date</i> |
|--------------------------|--|---------------------|-----------------|-------------|
| <b>Lykasov G.</b>        | Thermal effects for quark and gluon distributions in central heavy-ion collisions                            | Hadronic Matter     | 20 min          | TBA         |
| <b>Machavariani A.</b>   | Ward-Takahashi identity, screening and the magnetic moment of the Delta resonance                            | QCD III             | 20 min          | TBA         |
| <b>Manko V.</b>          | Quantum mechanics in probability representation  | Quantum Theory      | 30 min          | 23.06       |
| <b>Mathieu V.</b>        | The glueball spectrum from constituent models  | QCD III             | 20 min          | 25.06       |
| <b>Mayburov S.</b>       | Fuzzy space-time geometry and field quantization   | Math. Phys.         | 20 min          | 23.06       |
| <b>Melezhik V.</b>       | Confinement induced center-of-mass non-separability in quantum two-body problem                              | Quantum Theory      | 20 min          | 23.06       |
| <b>Melikhov D.</b>       | Light-cone expansion of hadron form factors  | QCD III             | 20 min          | 25.06       |
| <b>Mendes T.</b>         | Infrared propagators in MAG and Feynman gauge on the lattice   | QCD I               | 30 min          | 25.06       |
| <b>Minal D.</b>          | Determination of mass spectrum few-body systems with relativistic effects                                    | Quantum Theory      | 20 min          | 23.06       |
| <b>Mitrjushkin V.</b>    | TBA  | QCD I               | 20 min          | 25.06       |
| <b>Molodtsov S.</b>      | Gluon condensate behaviour at filling the Fermi sphere up. Some semianalytical models of ground state in QCD | QCD III             | 20 min          | 25.06       |
| <b>Moskaliuk S.</b>      | Cayley-Klein Topological Quantum Field Theory  | QFT                 | 20 min          | TBA         |
| <b>Narodetskii I.</b>    | Heavy baryons in the field correlator method   | QCD III             | 20 min          | 24.06       |
| <b>Neznamov V.</b>       | Standard model without Higgs bosons in the fermion sector  | QFT                 | 20 min          | 25.06       |
| <b>Nutma T.</b>          | Kac-Moody algebras & gauged supergravities   | Math. Phys.         | 20 min          | 25.06       |
| <b>Osipov A.</b>         | Impact of eight-quark interactions on chiral phase transitions   | QCD III             | 20 min          | 25.06       |
| <b>Pavlovsky O.</b>      | Born-Infeld Theory as low-energy limit of String Theory: from cosmology to hadron physics                    | Gravity & Cosmology | 20 min          | 23.06       |
| <b>Pawlowski J.</b>      | Confinement, chiral symmetry breaking and the phase diagram of QCD   | QCD I               | 30 min          | 25.06       |
| <b>Pena Castaneda C.</b> | Electroweak theory at low temperature conditions   | QFT                 | 20 min          | TBA         |
| <b>Pervushin V.</b>      | Frame of Reference in Cosmology  | Gravity & Cosmology | 30 min          | 26.06       |
| <b>Pestov I.</b>         | New Concept of Time and Spin   | Quantum Theory      | 20 min          | 23.06       |
| <b>Pinzul A.</b>         | UV/IR mixing in noncommutative field theories with twisted symmetry  | Math. Phys.         | 20 min          | 23.06       |
| <b>Polyakov D.</b>       | Alpha-Symmetries, Gluon Scattering and Confining String  | QCD III             | 20 min          | 25.06       |
| <b>Prokhorov L.</b>      | Physics at the Planck scales and unification of interactions   | QFT                 | 30 min          | 25.06       |
| <b>Radzhabov A.</b>      | Effects of mesonic correlations in the PNJL model  | QCD III             | 20 min          | 26.06       |
| <b>Reshetnyak A.</b>     | On Lagrangian formulations for mixed-symmetry bosonic HS fields on AdS spaces within BFV-BRST approach       | Math. Phys.         | 20 min          | 25.06       |
| <b>Rezaei B.</b>         | Next-to-Leading order Analysis of the Gluon Distribution at low x  | QCD II              | 20 min          | TBA         |

| <i>Name</i>           | <i>Title</i>  | <i>Section</i>      | <i>Duration</i> | <i>Date</i> |
|-----------------------|---|---------------------|-----------------|-------------|
| <b>Rodriguez M.</b>   | Radiative Fermion masses at MSSM  | QFT                 | 20 min          | 25.06       |
| <b>Rogalyov R.</b>    | Techniques of One-Loop Computations in Lattice Perturbation Theory  | QCD I               | 20 min          | 25.06       |
| <b>Santangelo E.</b>  | Phases of the Dirac determinant, Abelian Chern-Simons terms and Berry's phases in the field theoretic description of graphene | Math. Phys.         | 30 min          | 24.06       |
| <b>Schaefer B.-J.</b> | Exploring the QCD phase diagram with effective models   | QCD III             | 20 min          | 26.06       |
| <b>Schwenzer K.</b>   | A mechanism for quark confinement in Landau gauge QCD   | QCD I               | 20 min          | 25.06       |
| <b>Shavokhina N.</b>  | Fields and Minimal Surfaces: Classical and Quantum  | Gravity & Cosmology | 20 min          | 23.06       |
| <b>Shevchenko O.</b>  | TBA   | QCD II              | 30 min          | 23.06       |
| <b>Silenko A.</b>     | Classical and quantum equations of spin motion for particles in nonstatic spacetimes  | Gravity & Cosmology | 20 min          | 23.06       |
| <b>Slavnov D.</b>     | Locality and nonlocality in the quantum theory  | Quantum Theory      | 30 min          | 23.06       |
| <b>Smolyansky S.</b>  | Kinetics of vacuum creation of W and Z bosons in early universe   | Gravity & Cosmology | 20 min          | TBA         |
| <b>Solov'ev E.</b>    | Problems of time and canonical transformation in quantum physics  | Quantum Theory      | 20 min          | 23.06       |
| <b>Sorin A.</b>       | The arrow of time and Weil group: all supergravity billiards are integrable   | Math. Phys.         | 30 min          | 25.06       |
| <b>Surovtsev Yu.</b>  | Spectroscopic implications from the combined analysis of processes with pseudoscalar mesons                                   | QCD III             | 20 min          | TBA         |
| <b>Teckentrup T.</b>  | Are there approximate relations among transverse momentum dependent distribution functions?                                   | QCD II              | 20 min          | 23.06       |
| <b>Toneev V.</b>      | Hydrodynamic view at the NICA/CBM energy range  | Hadronic Matter     | 30 min          | 26.06       |
| <b>Teryaev O.</b>     | Hidden Connections in Nucleon Spin Structure  | QCD II              | 30 min          | 23.06       |
| <b>Tliso D.</b>       | Rare four-leptonic B-meson decays   | QCD III             | 20 min          | 26.06       |
| <b>Trusov M.</b>      | Feynman disentangling method and group theory   | Math. Phys.         | 20 min          | 23.06       |
| <b>Vernov S.</b>      | Localization of Nonlocal Linear Models  | Quantum Theory      | 30 min          | 23.06       |
| <b>Vernov Yu.</b>     | Reconstruction Theorem in Noncommutative Quantum Field Theory   | Math. Phys.         | 30 min.         | 24.06       |
| <b>Veselov A.</b>     | TBA   | QCD I               | 20 min          | 25.06       |
| <b>Visinescu M.</b>   | Fermions on curved spaces and quantum anomalies   | Math. Phys.         | 20 min          | 25.06       |
| <b>Zakharov A.</b>    | Constraints on dark matter distribution near the Galactic Centre  | Gravity & Cosmology | 30 min          | 26.06       |
| <b>Zhukovsky V.</b>   | Quantum effects in QED under the condition of Lorentz and CPT invariance violation  | QFT                 | 30 min          | 25.06       |