

**Regional Doctoral Program in Theoretical and Experimental Particle Physics
VolkswagenStiftung**

RDP School and Workshop on Mathematical Physics

A. Alikhanian National Science Laboratory (Yerevan Physics Institute)

Main Building, 3rd floor, Conference Hall

19-24 August 2023

Organizers

Ulf-G. Meißner, Bonn / Jülich
Akaki Rusetsky, Bonn
Armen Nersessian, Yerevan
Mirian Tabidze, Tbilisi
Rubik Poghossian

Local Organizing Committee

Milena Poghosyan, *Secretary*
Erik Khastyan, *Scientific Secretary*
Ruben Manvelyan
Armen Nersessian, *Chair*

PROGRAM

Workshop Program

19 August

09.00 **Registration**

09.20 **Opening**

09.30-10.00 **Alexander Orlov**, *Kurchatov Institute of Atomic Energy, Moscow*
Generalization of the Mironov-Morozov-Natanzon cut-and-join formula and new commuting families of differential operators of several variables

10.00-10.30 **Evgeny Ivanov**, *Joint Institute for Nuclear Research, Dubna*
N=2 superconformal higher spins from Harmonic superspace

10.30-11.00 **Ruben Manvelyan**, *Yerevan Physics Institute*
On Correlation Functions for Conformal Higher Spin Currents in d dimension

11:00- 11:30 Coffee Break

11.30-12.00 **Rubik Poghosian**, *Yerevan Physics Institute*
2d CFT/gauge theory correspondence in Argyres-Douglas points

12.00-12.30 **Hasmik Poghosyan**, *Yerevan Physics Institute*
Rank 5/2 Liouville irregular block and applications to gauge theory

12.30-13.00 **Gor Sarkissian**, *JINR, Dubna & Yerevan Physics Institute*
One-point matrix of the modular transformation in N=1 super Liouville field theory

13:00- 14:30 Lunch Break

14.30-15.00 **Tigran Hakobyan**, *Yerevan State University*
Dunkl deformation of $sp(N)$ Lie algebra

15.00-15.30 **Todor Popov**, *Institute for Nuclear Research and Nuclear Energy, Sofia*
Jordan algebras and magnetic monopoles

15.30-16.00 **Mahmut Elbistan**, *Bogazici University, Istanbul*
Various disguises of the Pais-Uhlenbeck Oscillator

16:00- 16:30 Coffee Break

16.30-17.00 **Kostya Druzhkov**
Internal Lagrangians of PDEs as variational principles

17.00-17.30 **Mustafa Mullahasanoglu**, *Bogazici University, Istanbul*
Recent developments in gauge/YBE correspondence

19.00 Reception, *“Olympia Garden” Hotel, 64 Barbusse Street*

20 August

10.00-10.30 Armen Allahverdyan, *Yerevan Physics Institute*

Energy densities in quantum mechanics

10.30-11.00 Farhang Loran, *Isfahan University of Technology*

Propagating-wave approximation in potential scattering

11.00-11.30 Coffee break

11.30-12.00 Artur Ishkhanyan, *Institute of Physical Research, Ashtarak, Armenia*

The Grad–Shafranov Equation in Cap–Cyclide Coordinates:

The Heun Function Solution

12.00-12.30 Vahagn Abgaryan, *JINR, Dubna & Yerevan Physics Institute*

On the convex structure of the body of absolutely separable states

12.30-13.00 Nikita Levin, *Tomsk State University*

Generalized Maxwell-Juttner distribution for rotating spinning particle gas

13:00- 14:30 Lunch Break

14.30-15.00 Tigran Tchrakian, *Dublin Institute for Advance Studies*

Skyrme Chern-Simons densities

15.00-15.30 Yakov Shnir, *JINR, Dubna & Oldenburg University*

Solitons in the U(1) Gauged Skyrme-Maxwell Model

15.30-16.00 Irina Pirozhenko, *Joint Institute for Nuclear research, Dubna*

On characteristic boundary value problem and polyhomogeneous spacetimes

16.00- 16.30 Coffee break

16.30-17.00 Merab Gogberashvili, *Javakishvili Tbilisi State University*

Spherically symmetric solution of Cotton gravity

17.00-17.30 Aliasqar Parvizi, *Institute for Research in Fundamental Science , Tehran*

Hydro & Thermo Dynamics at Causal Boundaries

17.30-18.00 Alexandre Gurchumelia, *Javakishvili Tbilisi State University*

Split octonionic field theories

21 August

- 09.30-10.00** **Sergey Krivonos**, *Joint Institute for Nuclear Research, Dubna*
Higher Schwarzians
- 10.00-10.30** **Dmitry Bykov**, *Steklov Mathematical Institute, Moscow*
Grassmannian sigma models as Gross-Neveu models
- 10.30-11.00** **Stepan Sidorov**, *Joint Institute for Nuclear Research, Dubna*
Non-linear spin multiplets

11.00- 11.30 Coffee break

- 11.30-12.00** **Karapet Mkrtchyan**, *Imperial College, London*
Democratic Lagrangians and where to find them
- 12.00-12.30** **Dmitry Kaparulin**, *Tomsk State University*
Dynamics of spinning particles in the worldsheet formalism
- 12.30-13.00** **Victor Mishnyakov**, *Lebedev Physical Institute, Moscow*
Commutative subalgebras of the Affine Yangian $Y(\mathfrak{gl}_1)$ and matrix models

13.00-13.30 Coffee Break

- 13.30-14.00** **Alexei Isaev**, *Joint Institute for Nuclear Research, Dubna*
Feynman diagrams, operator formalism and conformal field theory
- 14.00-14.30** **Bruce Westbury**
Series of representations

14.30-15.00 Break

- 15.00-15.30** **Maxim Zabzine**, *Uppsala University*
Closed/open strings and symplectic cuts
- 15.30-16.00** **Ruben Mkrtchyan**, *Yerevan Physics Institute*
Trebling of Kahler parameter, Klein bottles and constant maps in the refined Chern-Simons dualities
- 16.00** **Workshop Closing**

18.30 Dinner, “Edem Garden” Restaurant, 65 &78 Hrazdan Gorge

School Program

22 August

09.50 Introduction to School

10.00-11.00 **Ulf-G. Meißner**, *Bonn University/FZ Jülich*
Life on Earth - an accident?

11.00-11.30 Coffee break

11.30-13.00 **Andrey Mironov**, *Lebedev Physical Institute, Moscow*
 $W_{1+\infty}$ -algebra, many-body integrable systems and hypergeometric tau function
Lecture 1

13.00-14.30 Lunch break

14.30-16.00 **Gleb Arutyunov**, *II. Institute for Theoretical Physics, Hamburg University*
Wronskian Bethe Ansatz
Lecture 1

16.00-16.30 Coffee break

16.30-18.00 **Karapet Mkrtchyan**, *Imperial College, London*
Introduction to the problem of (electric-magnetic) duality-symmetric formulation
of field theory
Lecture 1

23 August

10.00-11.30 **Gleb Arutyunov**, *II. Institute for Theoretical Physics, Hamburg University*
Wronskian Bethe Ansatz
Lecture 2

11.30-12.00 Coffee break

12.00-13.30 **Karapet Mkrtchyan**, *Imperial College, London*
Introduction to the problem of (electric-magnetic) duality-symmetric formulation of field theory
Lecture 2

13.30-14.00 Coffee break

14.00-15.30 **Andrey Mironov**, *Lebedev Physical Institute, Moscow*
 $W_{1+\infty}$ -algebra, many-body integrable systems and hypergeometric tau-function
Lecture 2

24 August

10.00-11.30 **Karapet Mkrtchyan**, *Imperial College, London*
Introduction to the problem of (electric-magnetic) duality-symmetric formulation of field theory
Lecture 3

11.30-12.00 Coffee break

12.00-13.30 **Andrey Mironov**, *Lebedev Physical Institute, Moscow*
 $W_{1+\infty}$ -algebra, many-body integrable systems and hypergeometric tau-function
Lecture 3

13.30-14.00 Coffee break

14.00-15.30 **Gleb Arutyunov**, *II. Institute for Theoretical Physics, Hamburg University*
Wronskian Bethe Ansatz
Lecture 3

15.30 Closing