

Yerevan State University

Memorial Session



### Speakers:

### present and next

Viktor Matveev Dmitri Grigoriev Petr Tinyakov Vladimir Gavrin Boris Stern Vahe Gurzadyan Alexey Isaev Andrei Barvinsky Mikhail Vasiliev Zurab Berezhiani Anna Tokareva Alexander Parkhomenko

Dam Thanh Son Vyacheslav Spiridonov Alexander Dolgov **Glennys Farrar** Mikhail Danilov Yury Kudenko Gia Dvali Roman Nevzorov Wilfried Buchmueller Geraldine Servant Alexander Belyaev



International Conference on

### **Particle Physics and Cosmology**

October 02-07, 2023

Yerevan, Armenia



This is a Conference on Particle Physics and Cosmology dedicated to memory of Valery Rubakov who passed away in October 2022. The idea is to get together people from over the world to discuss the domains of physics he worked in and made breakthrough contributions. The conference is aimed to bring together world leading experts

and young researchers in the field of theoretical particle physics and related topics. and selected parallel sessions presentations.

#### **Main Topics**

Physics beyond the Standard Model Quantum chromodynamics, Cosmology and astroparticle physics strong interactions Gravity and its modifications Aspects of mathematical physics Neutrino physics Selected experimental results

#### Organizers

Alikhanian National Laboratory (Yerevan Physics Institute), Armenia

#### **International Advisory Committee**

Ani Aprahamian (AANL) George Lavrelashvili (TSU) Gregory Gabadadze (NYU) Alexey Smirnov (MPIK) Ruth Gregory (King's College London) Peter Tinyakov (ULB) Renata Kalosh (Stanford University) Neil Turok (U of Edinburgh)

Wilfried Buchmuller (DESY) Andrey Linde (Stanford University) Mikhail Danilov (LPI) Larry McLerran (U of Washington) Sergei Dubovsky (NYU) Slava Mukhanov (LMU) Glennys Farrar (NYU) Mikhail Shaposhnikov (EPFL) Dmitry Gorbunov (INR) Dam Son (U of Chicago) Dmitry Kazakov (JINR) Christof Wetterich (U of Heidelberg)



 
 Yulia Ageeva (INR)
 Dmitry Gorbunov (INR)

 Roza Avetisyan (AANL)
 Artur Hakobyan (AANL)
 Robert Avetyan (AANL) Ekaterina Kriukova (INR) Vladislav Barinov (INR) Vahram Sargsyan (AANL) Yulia Ageeva, email: y.a.ageeva2604@gmail.com erina Kriukova, email: katvakrvukova@in

# TO MEMORY OF CLOSE COLLEAGUE AND FRIEND VALERY A. RUBAKOV

 <sup>#</sup> Brilliant Theorist, Teacher and Organizer of scientific research and education" (Victor A. Matveev, Sci.leader of JINR)
 ( 35 years together in the Institute for Nuclear Research of RAS and in Russian Academy of Sciences)

Some Important Vallery Rubakov dates:

1955 – 19.10 2022;

1978 - Graduated from the Physics Faculty of Moscow State Un.;

- 1978 Postgraduate studies and then Theory Division in INR of RAS under supervision of Prof. Aleco Tavkhelidze;
- 1986 A. Tavkhelidze moves to the position of President of Academy of Science of Gorgia in Tbilisi, getting the position of the Scientific head of INR of RAS ;
- 1987 V. Matveev elected by the director of INR of RAS; forming a new directorate;

Valery A. Rubakov (senior researcher of Theory Division) were suggested and accepted the proposal to be the research deputy director of INR RAS. He was allowed to preserve his affiliation and work in the Theory division.

This position has to be approved by the Bureau of the Nuclear Physics Division of RAS. (Interesting story)!

It was my first experience to work with young research deputy (1987-1994). My first lessons of giving them an administrative responsibilities. But it is a great story!

His first significant scientific works (latter understood as the outstanding ones!) were done before accepting this position:

1980 :"The World on the Brane" (in coll. With Mikhail Shaposhnikov);

1981: "The Monopole decay of the proton";

1985: "The Non-conservation of the Fermionic charges in the ElectroWeak Interactions".

Valery Rubakov had brought a valuable (if not to say the principal one ) contribution into organization of the now world known and rather successful serious of the International Seminars "QUARKS" (together with A.N. Tavkhelidze and V.A. Matveev) on the Physics of "Elementary Particles, Quantum Field Theories and Cosmology".

Having the right to work as a staff member of the Theory Division he became practically the one of the leader of this laboratory. He was reading lectures at the Chair of the Quantum Statistics and Quantum Field Theory (N.N Bogolyubov and A.N. Tavkhelidze at the Moscow State University. Then on the Chair of QFT and Cosmology ( becoming its Chair from 2020 after A.N. Tavkhelidze) and partially on the Chair of the MPhTU (M.A. Markov->V.A. Matveev->M.V. Libanov). He has educated its own outstanding scientific school of theorists and wide educated physicists now very well known in the world physics community as the RUBAKOV SCHOOL. Without having any experience of the administrative work and scientific management Valery rather soon became one of the most effective member of the directorate. He definitely had a talent of the research leader. First of all he revealed high quality of responsibility, first of all of his personal responsibility, creativity and ability to find talented young people and concentrate them on the chosen ambitious task.

There was a complete trust between us. I used to consider him as the best candidate for the next director of the Institute when my (as I hoped) ten years term will come to the end.

But after seven years (at 1987 +7 = 1994) Valery once came to me and has stated:

"One year, no, one month more and I will stop to be a theorist! So, please, let me free!" I had not a choice but had agreed.

But what is important; even stepping down from the Directorate Valery preserved his responsibility for the fate of the Institute and development its major scientific directions. He still was one of the scientific leaders of the Institute!

As the scientific research Deputy Director and after stepping down from this position Valery Rubakov made a great contribution to the development of the scientific program amd work of the Baksan Neutrino Observatory, the Baikal Neutrino Station with the Deep Underwater Neutrino Telescope and of the other scientific laboratories of the INR of RAS, in organization of the thematic scientific Schools and seminars, as well as in organization and realization of the collaboration programs at the joint research installations.

For many years Valery Rubakov acted as the leader and manager of the fundamental research programs on the Elementary Particles Physics and Astrophysics and on the fundamental Nuclear Physics in the framework of the Presidium of the Russian Academy of Sciences program.

Valery Rubakov brought the big and valuable contribution into the work of the presidium of Russian Academy of Sciences and its Physics Devision, being the Head of the Section of Nuclear Physics. Once he was nominated for an election by the academician-secretary of the Physics Division of RAS but decided to withdrew his candidacy.

Valery Rubakov have plaid very important role in the work of the magazine "USPEKHY" («Успехи Физических Наук») being from 1999 his Deputy Chief Redactor and from 2004 his Chief Redactor. He was a member of the magazine "Theoretical and Mathematical Physics" redcollegia and the International of Modern Physics.

Valery Rubakov led very active scientific, organizational and social (общественную) life.

He was:

\*Member of the JINR Scientific Council;

\*Member of the Council of Science and Education of the President of the Russian Federation;

\*Member of the Expert Committee of the gold medals and prizes of the names of great academicians of RAS;

\*Member of the Committee of RAS of Combat Pseudoscience;

\*Member of the First July Club of RAS, and others.

It is very difficult to describe in a few words who was academician Valery Anatolievich Rubakov for all of us, for our Russian Academy of Sciences for our international community.

If shortly: He was the Mind and Conscience of our Science.

# **THANK YOU!** Victor A. Matveev (Scientific head of the JINR, Dubna.)



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Photo courtesy of INR



Photo courtesy of INR

# 1983 – Meeting with 3<sup>rd</sup> year students



Photo courtesy of INR

## 1983 – Meeting with 3<sup>rd</sup> year students

1985-86 – Going home by metro



Photo courtesy of INR

### 1983 – Meeting with 3<sup>rd</sup> year students

1985-86 – Going home by metro

ca.1985/86 – Birthday party



Photo courtesy of INR

## 1983 – Meeting with 3<sup>rd</sup> year students

1985-86 – Going home by metro

ca.1985/86 – Birthday party

1987-94 – Deputy Director of INR



Photo courtesy of INR

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1985-86 – Going home by metro

ca.1985/86 – Birthday party

1987-94 – Deputy Director of INR

1991/92 – Quarks'92



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### Some old photos

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BLOIS 2006



#### **BLOIS 2006**



March 2019



March 2019



#### Hambourg Nov 2021



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Hambourg Nov 2021



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# Valery Rubakov as an enlightener



## 2014, September, Peace March

Two styles of popular lectures:

The most of popular science speakers: Easy and shallow

# Valery Rubakov: Deep and clear

# Some videos

Where did the matter in the universe come from? 476 000 views https://www.youtube.com/watch?v=qjSfCHRGOck

Higgs boson discovered. What's next?

https://www.youtube.com/watch?v=yi87VJobUFQ

The Big Bang: what was and what will be https://www.youtube.com/watch?v=k1ZTYEyEjTg

360 000 views

## **205 000 views**





Д. С. Горбунов, В. А. Рубаков

#### ВВЕДЕНИЕ В ТЕОРИЮ РАННЕЙ ВСЕЛЕННОЙ





## For hard students (+ D. Gorbunov)

# Books

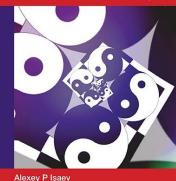


For hard students

**For scientists** 

(+ A.Isaev)

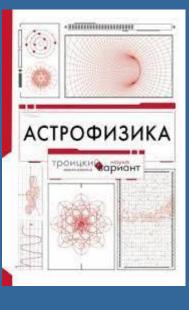
Theory of Groups and Symmetries Finite Groups, Lie Groups, and Lie Algebras



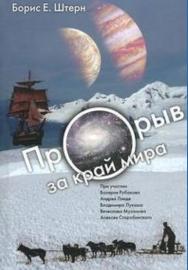
Valery A Rubakov

World Scientific

## For educated general Public (+ B.Stern)



(Scientific editor) For general educated public



## **Rubakov and "Troitsky variant"**

Antropic principle (2018) Dark energy in the Universe (2018) For the glory of dark matter (2018) The Universe before the hot Big Bang (2018) Sakharov and Cosmology: Baryon asymmetry of the Universe (2011) Scale bar of the universe (2011)



**Prospects for particle physics (2022, January)** 

## My suggestion:

Let's make a movie about Valery

**Troitsky variant production** 



We have:

An excellent movie editor Alexey Kudrya

A composer Andrey Klimkovsky in a reachable neighbourhood

A lot of people just around who can tell something interesting about Valery



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Yerevan State University, Armenia October 02 - 07, 2023

### **Conference on Particle Physics and Cosmology**

dedicated to memory of Valery Rubakov

#### **Memorial Session**

コントロント・ロント・ロックへの

#### институт физики высоких энергий

**Early Years** 

ИФВЭ 82-193 ОТФ

В заключение подчеркием, что главной трудностью, возникающей в данном подходе, является определение функционалов  $\Delta$ ,  $\Phi$  и  $\widetilde{\Delta}$  в представления (46) и (56).

Автор благодарев Б.А.Арбузову, В.Г.Кадышевскому, А.В.Разумову, В.А.Рубакову и Л.Д.Соловьеву за ряд ценных советов и обсуждения. Автор особенно благодарен В.А.Рубакому за указание на вжигость решения задачи Кощи для построения квытовой гоории. Автору также приятно поблагодарить Е.О.Меликкому за помощь в подготовке рукописи и полезные замечания.

#### Литература

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Рукопись поступила в издательскую группу 29 сентября 1982 года.

Conversation was in Moscow Metro

А.П.Исаев

к вопросу о квантовании релятивистской струны

#### Protvino, summer 1980 or 1981.



#### Early Years

#### Б.А. Арбувов. V.A. Rubakov, Superheavy Magnetic Monopoles Обициальные оппоненты: доктор физико-математических наук Б.М. Барбашов, профессор and Proton Decay, Pisma Zh.Eksp.Teor.Fiz. 33(1981)658 кандидат физико-математических наук младший научный сотрудник В.А. Рубаков. Ведущее научно-исследовательское учреждение: Научно-63.исоледовательский институт ядерной физики МГУ, Москва. ОБЪЕЛИНЕННЫЙ ИНС Dura Автореферат разослан 1983 года. 1983 года Защита диссертации состоится 2-83-224 **MCAEB** Алексей Петрович BOIIPOCM КЛАССИЧЕСКОЙ И КВАНТОВОЙ ДИНАМИКИ РЕЛЯТИВИСТСКОЙ СТРУНИ Специальность: 01.04.02 - теоретическая и математическая физика Автореферат писсертации на соискание ученой степени кандидата физико-математических наух XXI Rochester conference, Paris (1982)

G. t'Hooft, Concluding Summary Talk

профессор

Работа выполнена в Отделя теоретической физики Инотитута физики мосних емертий и в Либоратории теоретической физики Объединенного инотитуте прерых исследований . Научный руководится: подго фазика-симентических наук

#### Mid 1980s, early 90s

#### Nuclear Physics B256(1985)434-448

#### CLASSICAL VERSUS SEMICLASSICAL ELECTROWEAK DECAY OF A TECHNISKYRMION

J. AMBJØRN

NORDITA, Blegdamsvej 17, DK-2100 Copenhagen Ø, Denmark

#### V.A. RUBAKOV

NORDITA, Blegdamsnej 17, DK-2100 Copenhagen Ø, Denmark and Institute for Nuclear Research of the Academy of Sciences of the USSR, Moscow, USSR\*

Received 10 January 1985

We study numerically the classical behavior of the Skyrne model coupled to an SL gang field. We find that if the parameters of the model are chosen in such a way that skyrmion mass is smaller than a critical value M<sub>ext</sub>. It is the skyrmion is classically studie. For values of the parameters there are no values values values of the classical field equations or the skyrmion We (ind that the transition between these two classical engine micro-order one. We climit that the transition between these two classical engine there of the skyrmion We (ind that the transition between these two classical engine there of the skyrmion We (ind that the transition between these two classical engine there of the skyrmion We (ind that the transition between these two classical engine

#### 1. Introduction

A remarkable property of various gauge theories is a 0-structure of the gro state which leads to the anomalous non-conservation of fermion quantum numb such as axial U(1) in four-dimensional QCD [1] and two-dimensional QCD [2 baryon number in the electroweak theory [1]. The common belief is that off-ordimensional non-abelian theories with weak gauge couplings, these effects associated with instantons [3] describing the tunneling transitions between we



## КЛАССИЧЕСКИЕ Калибровочные Поля

#### Chapter 3. Elements of group theory and Lie algebras Chapter 8. Elements of homotopic topology

РОССИЙСКАЯ АКАДЕМИЯ НАУК Институт ядерных исследований

#### В.А.Рубаков

Д. С. Горбунов, В. А. Рубаков

ВВЕДЕНИЕ В ТЕОРИЮ РАННЕЙ ВСЕЛЕННОЙ

Космологические возмущения

Инфляционная теория

MOCKB/

Аленсен, Dolloran Siawg apro co my hureert 06.12.2010

#### Books "Theory of Groups and Symmetries", 2011 - ...

Dubna, 2014



Finite Groups, Lie Groups, and Lie Algebras



Alexey P Isaev Valery A Rubakov

Rubakov 

Isaev

Theory of Groups and Symmetries



А.П.ИСАЕВ В.А.РУБАКОВ

ТЕОРИЯ ГРУПП И СИММЕТРИЙ ные группы. Группы и алгебры Ли



#### Tremendous ability to work hard

Translated into English by V.A. Rubakov



#### Bogoliubov Conference, Dubna, 2009



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#### Schools for students, young scientists, ... Dubna, CERN-JINR, ... $\sim$ 2000





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# Valery Rubakov

# and International Center for Fundamental Physics in Moscow

M.A.Vasiliev

Lebedev Institute, Moscow

Rubakov conference 23, Erevan, October 02, 2023

# Creation

International Center for Fundamental Physics in Moscow (ICFPM) was created in 1993 and closed in 2021. It was a small foundation founded by FIAN and NORDITA, aimed at supporting young scientists in FSU.

The story started in the early nineties when the economic situation in FSU was extremely bad.

It was most urgent to support the best PhD students and postdocs.

One of the important points was that ICFPM should work for all of theoretical physics in FSU.

Rubakov actively participated in the project during all those years.

## Governing Board and Scientific Council

The general activities of the Center were coordinated by the Governing Board that consisted of V. Agranovich, D. Amati, A. Andreev, A.Arima, L. Brink (chairman), M. Dresselhaus, H.Feshbach, J. Friedel, P. Fulde, L. Gorkov, M. Jacob, L. Keldysh (vice chairman), V. Ogievetsky, C. Pethick, D. Pines, M. Rees, T. M. Rice and M. Vasiliev.

The idea of Brink and Pethick was to create a balanced Scientific Council responsible for elaboration of the functioning policy, composed of the representatives of different leading research institutes in Russia.

The original SC had the following members. Vasiliev (FIAN) chairman, Rubakov (INR), Mineev (ITP), Gurevich (FIAN), Suris (Ioffe Institute), Novikov (ITEP), Yakovlev (Ioffe Institute), Loiko (Executive director, FIAN), Luther (Nordita), Neveu (U. of Montpellier). The original SC had some rotations at the later stage. In 2011 Rubakov was appointed as chairman.

## **International Support and Dynasty Foundation**

Originally, the financial support was provided by the Swedish Ministry of Sciences, Tamala foundation, INTAS and the Russian Ministry of Sciences. Though the scale of support was very modest, it allowed to support hundreds of young researchers in theoretical physics

Later on, the level of western support was gradually reduced until it terminated around 2000. As a result, the Center froze its activities for about two years until a representative of the Dynasty foundation contacted us asking for advice on the best way to support Russian science. The Dynasty foundation was created by the founder of Beeline Dmitry Borisovich Zimin who had a scientific radio-engineering background allowing him to appreciate the role and beauty of science, including physics and math in the first place.

## Program

With the key participation of Rubakov the Center had developed an efficient scheme of Fellowship programs:

for PhD students and junior scientists without degree

for junior Postdocs

for young scientists with Second level degree (rehabilitation)

The numbers of stipends versus a number of applications in 2003-2007

	2003	2004	2005	2006	2007
Students					
(2200 rubles $\sim$ \$90 per month)	60-89	59-104	43-139	41-122	40-109
Postgraduate students and					
researchers without scientific degree					
(5 200 rubles $\sim$ \$210 per month)	50-111	40-152	40-169	36-154	
Postdocs					
(15 000 rubles $\sim$ \$600 per month)	10-46	10-67	16-112	14-111	10-97
Doctors of sciences					
(20 000 rubles $\sim$ \$800 per month)	-	-	-	-	5-25

# Other programs

- The program of support of scientific conferences
- **Annual Scientific summer schools in theoretical physics**
- Postdoc positions at Imperial College London
- Support of participation of junior scientists in short-term topical international programs
- Public Lectures in Moscow on the advances in science
- This program was very successful lasting for the period 2002-2015 up to the point when the Dynasty foundation was forced to stop its activities in 2015 for reasons unrelated to its scientific program in collaboration with ICFPM.

## The Role of Rubakov

The activities of the Center (in particular, in association with the Dynasty Foundation) had significant impact on other programs of support for Russian scientists later initiated in Russian Federation both at Federal and private level (for instance, by the Basis foundation).

Rubakov played the key role in shaping the activities of ICFPM. For instance, it was his strong point that the time demanding expertise of the members of the Council was always done on the unpaid basis

Scientific merits in the first place

**Balance between the schools** 

Valery was also a member of the Council of Dynasty together with other great people like, for instance, Ruben Vardanyan and late Evgeny Yasin



## With wishes to the next generations to keep great traditions of

Valery Anatolievich Rubakov



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# Rubakov's theorem

• "If one performs all the calculations correctly, one will obtain a correct result"



А. П. Исаев, В. А. Рубаков ТЕОРИЯ ГРУПП И СИММЕТРИИ Конечные группы. Doporary Mony na namero n, nageroco, gue halloza Art Art Группы и алгебры Ли Bly 8 auf 01.03.2019 URSS москва



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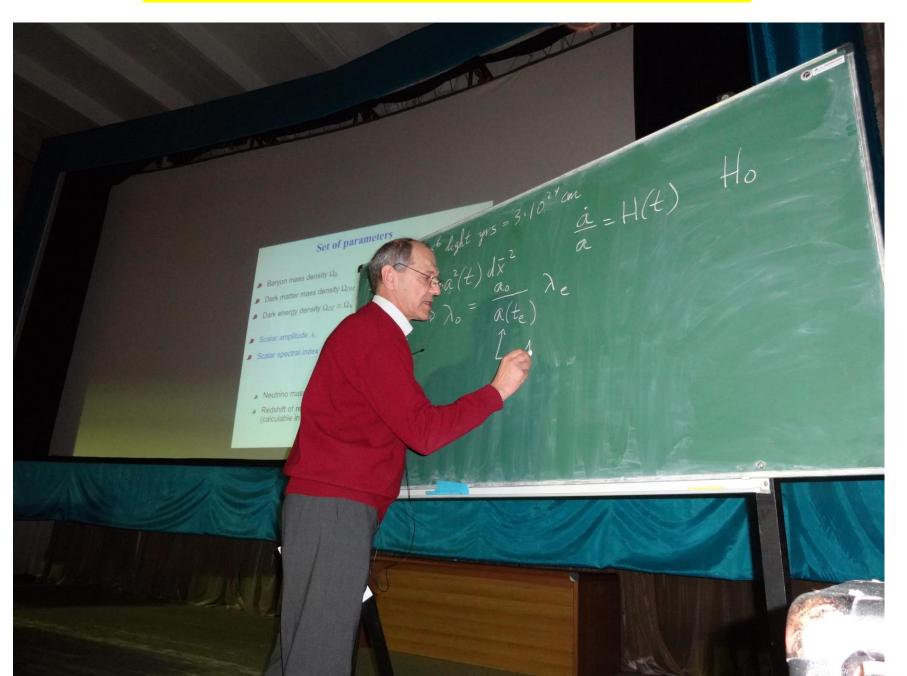
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Dam Thanh Son Vyacheslav Spiridonov Alexander Dolgov **Glennys Farrar** Mikhail Danilov Yury Kudenko Gia Dvali Roman Nevzorov Wilfried Buchmueller Geraldine Servant Alexander Belyaev

### **Lectures at the Moscow International School of Physics**



### Ski competition at the Moscow International School of Physics



### Celebration of the International Center of Interdisciplinary Science and Education Inauguration, Vietnam 2013







### After swimming at Qui Nhon









#### Speakers:

#### present and next

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## **VALERY RUBAKOV**



### Yury Kudenko, Tatiana Kudenko

### **INR, Moscow**

International Conference on Particle Physics and Cosmology dedicated to memory of Valery Rubakov 2-7 October 2023, Yerevan, Armenia





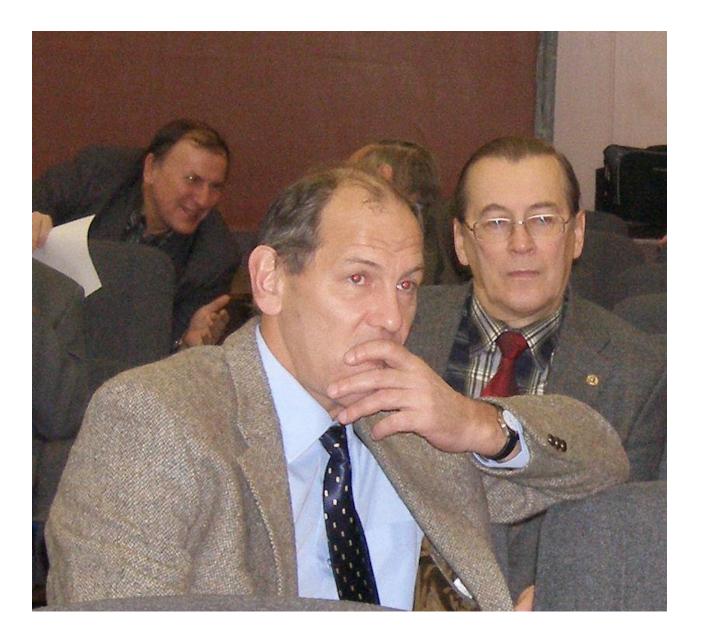




### 2013

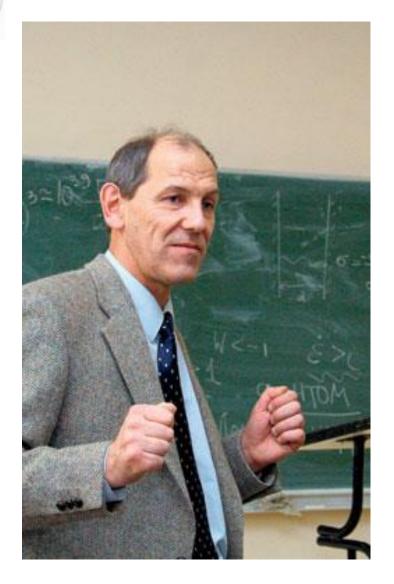


With A.Tavkhelidze 2006



## With V.Matveev 2006







### QUARKS-2010 Suzdal



### With V.Lobashev 2004





2015

Y&T Kudenko I

INR RAS





### With D.Shirkov QUARKS 2004



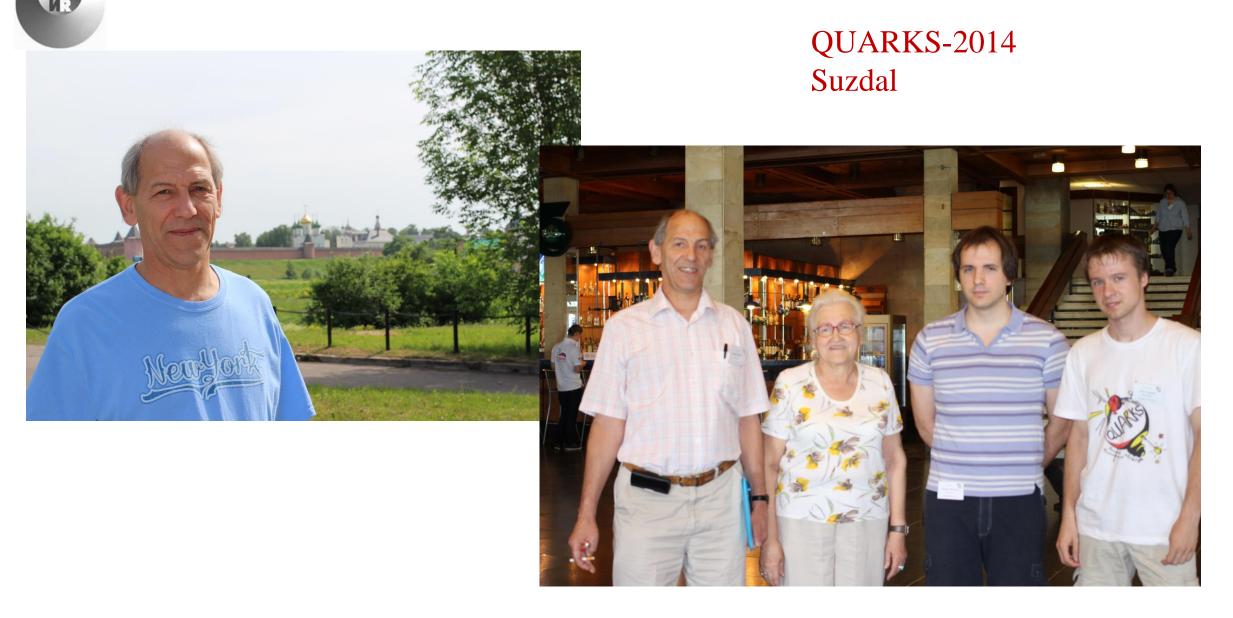
Dicussion on the RAS Particle Physics Program 2006



### 2013



With A.Petrukhin and Y.Kudenko School at INR 2003





Meeting with Deputy Minister at INR in 2015



Meeting with Nobel Prize Laureate T.Kajita at RAS in 2019



### Caucasus, Baksan 2016



#### Speakers:

#### present and next

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#### A few remarks...

Roman Nevzorov (Lebedev Physical Inst.)

**International Conference on** 

Particle Physics and Cosmology

(Rubakov Conference 2023)

Roman Nevzorov (Lebedev Physical Inst.)

A few remarks...

・ ● ● ● ● ■ ● ● ■ ● ● ■ ● ○ Q ○ (Rubakov Conference 2023) 1 / 4

- First time I met Valery Anatolyevich Rubakov in Autumn 2000. My second PhD adviser (Karen Avetovich Ter-Martirosyan) recommended me to give a seminar in the Institute for Nuclear Research (INR) of the Russian Academy of Sciences. During this seminar and after it I had a very enlightening and instructive discussions with Valery Anatolyevich and young members of his group (Dmitry Gorbunov, Sergei Troitskii, Maxim Libanov, etc).
- After the successful defence of my PhD thesis I was working in Germany, UK, USA and Australia for almost fourteen years. Every time I was returning back to Russia I was trying to come to INR and discuss my results with Valery Anatolyevich and his group. So I had many fruitful and helpful discussions with him and other members of INR Theory Division.
- Once in 2009 Valery Anatolyevich invited me to give a course of lectures on "Phenomenological aspects of Supersymmetry (SUSY)" at the Dynasty Foundation Summer School (Protvino, Moscow region, Russia, 10-20 August, 2009). This was just before I moved from Glasgow University to Hawaii University. I agreed and gave several lectures on SUSY.

Roman Nevzorov (Lebedev Physical Inst.)

A few remarks...

- Valery Anatolyevich Rubakov was also lecturing at this Summer School. He presented a fantastic course of lectures on "Alternative theories to SUSY". In particular, he discussed Technicolor, composite Higgs models as well as theories with extra spatial dimensions.
- His wonderful course stimulated my own investigations of Grand Unified Theories (GUTs) with extra spatial dimensions, i.e. orbifold GUTs, during my stay in Honolulu. Moreover since my arrival to Adelaide (South Australia) in 2013 I started working on composite Higgs models that can originate from  $E_6$  orbifold GUTs.
- My decision to move back from Adelaide to Moscow in 2017 was strongly motivated by the presence of large particle theory community in Russia that involves scientists like Valery Anatolyevich Rubakov.
- In 2019 I defended my habilitation thesis in INR. Valery Anatolyevich was chairing this meeting (in very alive manner).
- The talk, that I am going to present at this Conference, is based on the article that appeared as a result of the discussions which took place during the defence of my habilitation thesis.

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- In the course of the preparation of my habilitation thesis I realised that many members of the particle physics community believe that low energy SUSY has been basically ruled out by the LHC experiments. Because of this in 2020 I applied for RFBR grant that permitted me to prepare a review article on "Phenomenological aspects of supersymmetric extensions of the Standard Model" for Physics-Uspekhi (UFN).Valery Anatolyevich, who was Editor-in-Chief of this journal, supported my intension.
- My review paper was accepted in July 2022. It was published in July 2023.
- Valery Anatolyevich Rubakov has been one of the inspirational leaders of scientific community in Russia for several decades. He was a prominent figure in theoretical physics, a brilliant organizer and a great human being.

### Many Thanks, Valery Anatolyevich!!



#### Speakers:

#### present and next

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# Valery Rubakov in Hamburg

Valery Rubakov had long and active interaction with DESY, starting in the late 80's with Roberto Peccei as head of theory group; since then many visits to DESY (seminars, lecture series, talks at DESY TH Workshop, ..., visits of younger colleagues; also visits of DESY theorists in Russia, Ahmed Ali, Andreas Ringwald, ..., bi-anual Quarks conf. series and other occasions, ...



Yaroslavl '96; broad and intense physics progamme, but also time for cultural events (e.g. visit of performance in Mariinski Theater in St. Petersburg, from Novgorod '02) **2010:** election as member of Hamburg Academy of Science and Humanities in recognition of his scientific achievements, participation in activities of Academy





**2020:** Hamburg Preis für Theoretische Physik (Pauli Centre for Theoretical Physics & Herz foundation), special event in Hamburg Planetarium and 3-day conference on particle physics and cosmology





Beyond his scientific work, Valery Rubakov took responsibility for his young collaborators, for science in Russia and around the world; his advice was very much appreciated; this led to encounters on various occasions, for instance at meetings of the Scientific Policy Committee at CERN

From: Wilfried Buchmuller wilfried.buchmueller@desy.de Subject: cern Date: 26. September 2022 at 17:50 To: rubakov@inr.ac.ru Cc: Wilfried Buchmuller buchmuwi@mail.desy.de

Dear Valery,

I am missing you at this year's SPC meeting, but I am optimistic that we will meet again on this occasion in the future!

Best regards, Wilfried

From: V.A.Rubakov rubakov@inr.ac.ru
Subject: Re: cern
Date: 26. September 2022 at 19:47
To: Wilfried Buchmuller wilfried.buchmueller@desy.de
Cc: Wilfried Buchmuller buchmuwi@mail.desy.de

Dear Wilfried, Today I had a series of other meetings which I could not skip, unfortunately.

Indeed, I also hope we will meet at some point despite everything.

Best wishes,

Valery

Last email exchange a year ago during SPC meeting in September 2022

We shall remember Valery as a great physicist, a great teacher, as someone who took responsibility and, most of all, as a friend.



### Speakers:

### present and next

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Dam Thanh Son Vyacheslav Spiridonov Alexander Dolgov **Glennys Farrar** Mikhail Danilov Yury Kudenko Gia Dvali Roman Nevzorov Wilfried Buchmueller Geraldine Servant Alexander Belyaev

# Valery Rubakov's visits in Hamburg in the last decade

WOLFGANG PAULI CENTRE Theory Colloquium A COMPETENCE FIELD OF PIER **Towards Bouncing and Genesis Cosmologies** PIER Partnership of Universität Hamburg and DESY lis tarrey **Theoretical Physics Symposium 2020** by Valery Rubakov (INR Moscow) Wednesday Jan 23, 2019, 2:30 PM → 3:30 PM Europe/Berlin 25 November 2020 build. 2a, SR2 (DESY Hamburg) https://desy.zoom.us/j/3544139367 Meeting ID: 354 413 9367 Passcode: WPC251120! The Symposium in 2020 offers two scientific seminars: **DESY THEORY WORKSHOP Implications of the** Valery Rubakov HELMHOLTZ r Nuclear Research of the Russian Academy SEPT. 23 - 26, 2014 | GEMEINSCHAFT **Early LHC for Cosmology** 4:30 **DESY, Hamburg, Germany** Hard job of starting the Universe PARTICLE COSMOLOGY AFTER PLANCK Neil Turok **DESY**, Hamburg liggs Chair of Theoretical Physics, University of Edinburgh 18-20 April 2012 PLENARY SPEAKERS INCLUDE 15.30 Sept. 23 - 26, 2014 Path Integrals for the Universe C. Frenk (Durham) L. Amendola (Heidelberg) D. Schwarz (Bielefeld) Invited Speakers: P. Binetruy (APC Paris) M. Garny (CERN) G. Shiu (IAS Hongkong) F.R. Bouchet (IAP Paris) R. Sunyaev (MPA Garching) J. Garriga (Barcelona) The Hamburg Prize for Theoretical Physics was brought into being K. Danzmann (IGP, AEI Hannover in 2010 and recognizes outstanding achievements in the discipline R. Bousso (Berkelev) M Hindmarsh (Sussey/Helsinki TMP Tait (Irvine) of theoretical physics. It is endowed by the Joachim Herz Foundation Garcia-Bellido (Madrid) R. Kallosh (Stanford) T. Bringmann (Oslo N. Toro (Perimeter Inst.) with a prize money of 137,036.00 euros. S. Grojean (CERN) J. Kopp (MPK Heidelberg A. Westphal (DESY) J. Conlon (Oxford) Haller (Hamburg) R. Durrer (Geneva) V. Rubakov (INR Moscow V. Mukhanov (LMU Munich) **DESY Heinrich-Hertz Lecture on Physics** Sept. 25, 2014 H.-P. Nilles (Bonn) S. Pokorski (Warsaw) A. Linde (Stanford) A. Ringwald (DESY) V. Rubakov (INR Moscow) PARALLEL SESSIONS AND CONVENORS Sept. 24 - 25, 2014 M.Shaposhnikov (Lausanne) S.-H. Tye (Cornell, IAS Hongkong) ntributions by young researchers are especially encouraged. Abstracts can be submitted online before 15 August 2014 • The Higgs Sector T. Yanagida (IPMU Tokyo) Limited financial support for young physicists is available upon reques stophe Grolean, Thomas Konstandin, Volker Schom Supersymmetry Cosmology & Astroparticle Physics: S. Antusch (Basel) , H. Päs (Dortmund) Phenomenology: M. Mühlleitner (Karlsruhe), W. Porod (Würzburg) Phase Transitions Strings & Mathematical Physics: T. Grimm (Munich), M. Staudacher (Berlin Primordia vitational Waves Organizing Committee: **ORGANIZING COMMITTEE** CONTACT INFORMATION Public Talk: P. Schle per (Hamburg) **AKADEMIE DER** M.Baumgartl W. Buchmüller Mrs. C. Guerrero A. Hebecke Ms. J. Herrmann W.Buchmüller L. Covi Institut für Theoretische P DESY-Theorie Iniversität Heidelberg J. Louis Notkestr. 85 A. Ringwald D-22603 Hambur T. Konstandin Germany A. Westphal Email: theorie.sekretariat@desv.de Tel: +49-(0)40-8998-3590/2413 Fax: +49-(0)40-8998-2777

Background image: House of Knowledge" (Dalia Klein, 1994

Web page: http://th-workshop2014.desv.de

http://www.wpc-hh.de

# WISSENSCHAFTEN IN HAMBURG



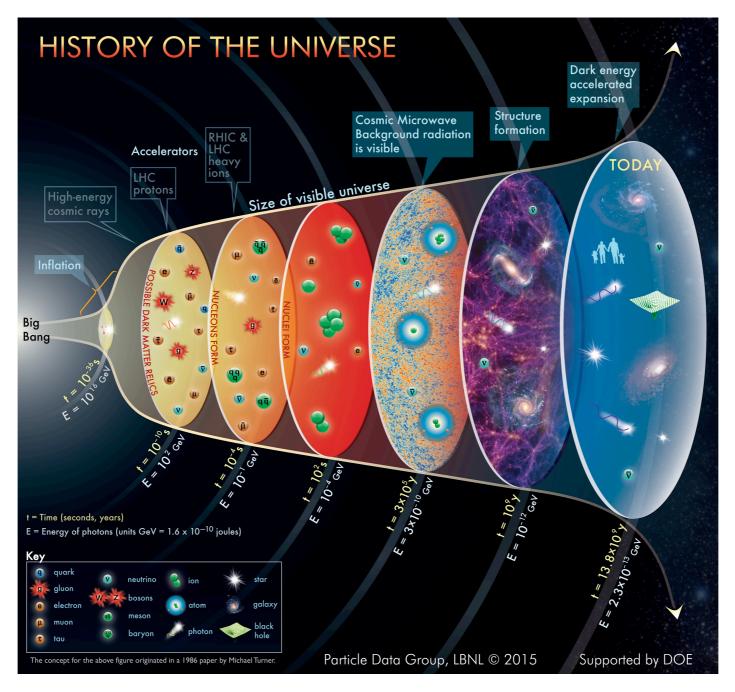
# Valery Rubakov & Hamburg Research

Higgs, Dark Matter & Cosmology

High energy astroparticle physics

Formal aspects of mathematical physics and field theory

Valery incarnates all fundamental research topics being investigated in Hamburg





CLUSTER OF EXCELLENCE QUANTUM UNIVERSE



# Hamburg Prize for Theoretical Physics 2020

# Valery Rubakov





# **3-hour Zoom celebration event on 25-11-2020 187 colleagues connected from all over the world!**



### WOLFGANG-PAULI-CENTRE

A COMPETENCE FIELD OF PIER



### Theoretical Physics Symposium 2020

### November 25, 2020

Europe/Berlin timezone

Enter your search term

Q

Overview
Poster
Support
theorie.sekretariat@des

The Wolfgang Pauli Centre for Theoretical Physics, a joint forum of the Universität Hamburg and DESY, organizes a mini Symposium to celebrate the Hamburg Prize for Theoretical Physics 2020 which was awarded to Prof. Valery Rubakov this year. The event will consist of two scientific talks. First seminar will be given by Prof. Valery Rubakov, Chief Researcher at Institute for Nuclear Research of the Russian Academy of Sciences in Moscow and Professor at M.V. Lomonosov Moscow State University. The second seminar will be delivered by Prof. Neil Turok, Higgs Chair of Theoretical Physics, University of Edinburgh.

**Scientific Programme:** 

14:30: Valery Rubakov: "Hard job of starting the Universe" 15:30: Neil Turok: "Path Integrals for the Universe"

Zoom link <u>https://desy.zoom.us/j/3544139367</u> Meeting ID: 354 413 9367 Passcode: WPC251120!

### Local organizing committee

Christophe Grojean, Thomas Konstandin, Volker Schomerus, Geraldine Servant, Alexander Westphal.

# Actual ceremony at the Hamburg planetarium on 25-11-2021





Picture credit: Joachim Herz Stiftung/Claudia Höhne

# A video extract



### 

# 

### WOLFGANG-PAULI-CENTRE A COMPETENCE FIELD OF PIER



### Theoretical Physics Symposium 2021

lov 8 – 12, 2021 ESY Hamburg urope/Berlin timezone	Enter your search term Q
	Zoom room: 811 1447 3065, Passcode: 948427
Overview	The Wolfgang Pauli Centre for Theoretical Physics, a joint forum of the Universität Hamburg and DESY,
Timetable	in collaboration with the Clusters of excellence CUI: Advanced Imaging of Matter and the Quantum
	Universe, organzises a scientific Symposium to honor the Hamburg Prizes for Theoretical Physics 202
Registration Symposium	and 2021 which are being awarded to Prof. Valery Rubakov (INR Moskow) and Prof. Eugene Demler
Participant List	(ETH Zuerich), respectively.
Registration Award	The first half of the Symposium on Nov 8-10 is devoted to the work of Valery Rubakov and it will feature
Ceremony (no longer available)	scientific talks in the following areas:
How to get to DESY	Advanced topics in Quantum Field Theory
now to get to DEST	Cosmology
Online	<ul> <li>Modified gravity</li> </ul>
discussion/questions	The second half of the Symposium on Nov 10-12 is devoted to the work of Eugene Demler and it will
upport	feature scientific talks in the following areas:
	<ul> <li>Novel phases of matter in quantum many-body systems</li> </ul>
theorie.sekretariat@des	<ul> <li>Driven quantum many-body systems</li> </ul>
	<ul> <li>Topological effects in quantum many-body systems, such as quantum antiferromagnets, quantu</li> </ul>
	spin liquids, etc.
	<ul> <li>Nonlinear xray spectroscopy of condensed matter</li> </ul>
	The award ceremony for the Hamburg Prize for Theoretical Physics is organized by the Joachim Herz
	Stiftung on November 10 in Hamburg's Planetarium. Participation requires a separate registration.
	Recordings of the talks:
	Video recordings of the talks are available on the DESY webcast portal (search for WPC 2021).
	Confirmed Speakers Nov 8-10
	S. Dubovsky (New York U., USA)
	E. Dudas (Ecole Polytechnique, Palaiseau, FR)
	G. Dvali (LMU and MPI, Munich, DE)
	R. Gregory (Kings College, London, UK)
	L. Heisenberg (ETH, Zurich, CH)
	A. Linde (Stanford U., USA)
	Y. Nir (Weizmann Institute of Science, Rehovot, IS)
	O. Pujolas (IFAE, Bellaterra, ES)
	R. Rattazzi (EPFL, CH)
	M. Shaposhnikov (EPFL, CH)
	A. Smirnov (MPIK, Heidelberg, DE and ICTP, Trieste, IT)
	D. Son (Chicago U., USA) P. Tinyakov (ULB, BE)
	E. Trincherini (SNS, Pisa, IT)

# AVIGNON, 2008



### **Progress on Old and New Themes in cosmology**

(PONT d'Avignon 2008)

April 21<sup>st</sup> - 25<sup>th</sup>, 2008

Palais des Papes, Avignon, France





## **ASPEN, 2000**

# INDEPENDENCE PASS Elevation 12,095 feet

CONTINENTAL DIVID

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C. Grojean C. Csaki V. Rubakov



### Speakers:

### present and next

Viktor Matveev Dmitri Grigoriev Petr Tinyakov Vladimir Gavrin Boris Stern Vahe Gurzadyan Alexey Isaev Andrei Barvinsky Mikhail Vasiliev Zurab Berezhiani Anna Tokareva Alexander Parkhomenko

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### THANK YOU

### We proceed with the Welcome party

Yerevan State University

Memorial Session

Rubakov Conference 25/25