



Lomonosov Moscow State University



Institute for Theoretical and Mathematical Physics

itmp.msu.ru

December 2020

About ITMP

- ❑ ITMP is a division of MSU. It is the advanced research centre in the field of fundamental theoretical and mathematical physics.
- ❑ ITMP was founded in December 2018. The Institute is supported by the Theoretical Physics and Mathematics Advancement Foundation «BASIS».
- ❑ Our main goal is to become a research centre of international level. We aim at growing into a platform for cooperation between national and foreign researchers, students and PhD students.

Presently, the activity of the Institute is focused on the following areas:

- ❑ string theory and quantum gravity,
- ❑ conformal field theories and AdS/CFT correspondence,
- ❑ integrable systems,
- ❑ quantum field theory and mathematical methods
- ❑ modified gravitation theory and cosmology.

Scientific Council:

VALERY RUBAKOV

Institute for Nuclear Research RAS, Faculty of Physics MSU, a chairman

ARKADY TSEYTLIN

ITMP MSU, Lebedev Physical Institute RAS, Imperial College London (UK)

GLEB ARUTYUNOV

Hamburg University (Germany)

VLADIMIR BELOKUROV

Faculty of Physics MSU

MIKHAIL VASIL

Lebedev Physical Institute RAS

MAXIM GRIGORIEV

ITMP MSU & Lebedev Physical Institute RAS

SERGEY KOZYREV

Steklov Mathematical Institute RAS

DMITRY LEVKOV

ITMP MSU & Institute for Nuclear Research RAS

ALEXEY SEMIKHATOV

Lebedev Physical Institute RAS

The Scientific Council includes outstanding researchers, scientific members and ITMP employees, and decides on the development strategy, principles of working ideas and key personnel decisions.

Our Team

Director



Prof. Arkady Tseytlin

Research interests of Arkady Tseytlin include quantum field theory and quantum gravity, superstring theory, conformal theories and AdS/CFT correspondence. He obtained several key results in superstring theory and field theory. In particular, he developed the sigma model approach to string theory, discovered the fundamental role of Born-Infeld action as the open string effective action, developed the method of constructing composite solitonic solutions in supergravity describing supersymmetric bound states of branes, contributed to investigations of D-branes that led to AdS/CFT duality, constructed the action of superstrings in AdS5 x S5 space and made substantial contributions to the integrability-based approach to gauge-string duality.

Deputies Director



Maxim Grigoriev
Candidate of Physical and Mathematical Sciences



Dmitry Levkov
Candidate of Physical and Mathematical Sciences



Olga Mamontova
Candidate of Philological Sciences,
Deputy Director of administration

Administration



Julia Arydzhan
Records Manager

Our Team

Scientific Members

- ! based on the results of the international open competitions:
 - postdoctoral positions;
 - full-time PhD postgraduate fellowship;
 - fellowships for PhD students
- 5 Researchers and lecturers
- 6 PhD students (PhD positions / fellowships)
- 7 Researchers (postdocs), 2 of them are to be employed at the beginning of 2021
- 5 Researchers are foreign citizens
- 6 Associated members, leading researchers of RAS institutes. ITMP invited associated members for supervising research work of students and PhD students, as well as giving elective courses.

Our Team

International Recruiting

Results of the last calls for postdoctoral positions:

ITMP MSU postdoctoral positions – 2019:

88 applications

25 countries

4 winners

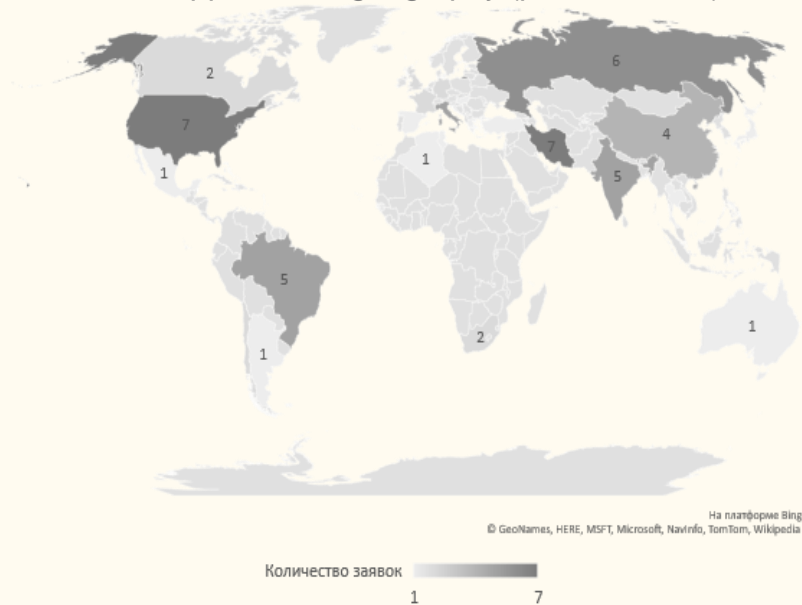
ITMP MSU postdoctoral positions – 2020:

188 applications

34 countries

3 winners

Applications geography (postdoc 2019)



Timeline of the competition

Call for applications

November - January

Evaluation of applications,
interviewing candidates

January - February

Offers

March

Start of the positions

October - November

Cooperation

Cooperation with RAS:

- Lebedev Physical Institute RAS
- Institute for Nuclear Research RAS
- Steklov Mathematical Institute RAS

International Cooperation:

- Imperial College London
- CERN
- Université Libre de Bruxelles
- Université de Tours
- Max-Planck-Institut für Gravitationsphysik
- Ludwig-Maximilians Universität München
- Universität Hamburg

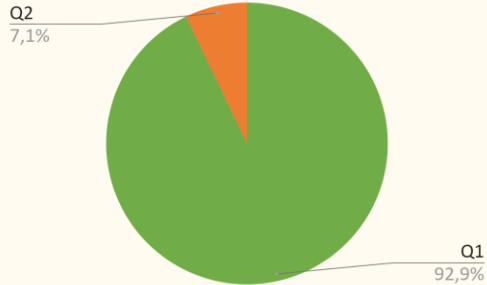
ITMP MSU is a **platform** for cooperation between students, PhD students, researchers, lecturers and researchers of the **leading national and foreign research centers and universities**.

Researchers from RAS institutes **supervise** research work of students and PhD students, give courses under the master's program “Quantum gravity and mathematical physics” and read electives courses.

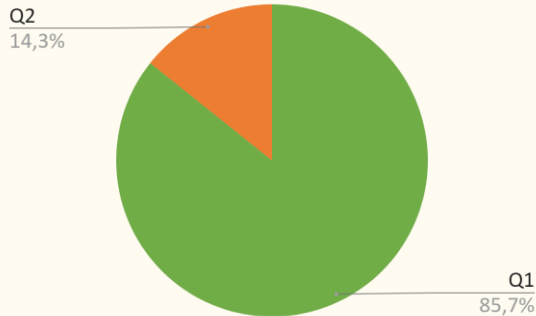
Researchers from international research centers give public lectures, take part in the **ITMP research seminars**, and do joint research with the Institute.

Research

Publications affiliated with ITMP



15 in 2019



25 in 2020
(December)

Invited researchers and ITMP research fellows report on the results of their research work at **ITMP Research Seminars**.

20 **seminars** were held for 2020 year. Russian and international employees of research centers and universities took part in ITMP seminars during the last year.

Seminars and presentations announcements available here: itmp.msu.ru/research/seminar/

ITMP Journal Club takes place twice a month. At the meeting students analyze publications that are significant for modern theoretical physics. The Journal club is intended mainly for starting researchers (students and PhD students).

Master's program “Quantum gravity and mathematical physics”

Our joint Master's program with the Faculty of Physics MSU started in the fall semester of 2019.

The program aims at training specialists, who will have skills of mathematical methods of quantum field theory, principles of conformal field theory, gauge and supersymmetric theories, classical and quantum gravity, superstring theory, and AdS/CFT correspondence.

Program graduates will have sufficient training to develop new mathematical methods and apply them to solving problems in theoretical and mathematical physics.

In 2019

8 students

of Faculty of Physics MSU and MPIT enrolled in ITMP Program.

In 2020

7 students

enrolled in ITMP Program, including 2 students of MEPHI, and 1 student of SPBU.

Students of MEPHI and MIPT attend certain courses of the program.

Master's program

Master's program co-supervisors:



Valery A. Rubakov, member of RAS, head of the Department of Particle Physics and Cosmology MSU



Boris I. Sadovnikov, professor, head of the Department of Experimental and Theoretical Physics MSU, head of the Department of Quantum Statistics and Field Theory MSU



Arkady A. Tseytlin, professor, director of ITMP MSU and professor at Imperial College London

Participants in the implementation of the program :

- Scientific members of ITMP MSU;
- Employees of the Faculty of Physics MSU;
- scientists from RAS institutes and other Russian and foreign research centers.

ITMP MSU holds **11 core courses**. The total number of the core courses is 15.

Especially, we focus on **research work of our students**. They consult with ITMP employees on scientific questions.

Education

Elective Courses

For the past 1,5 ITMP offered 12 elective courses.

EXTERNAL LECTURERS WERE INVOLVED TO READ THE COURSES :

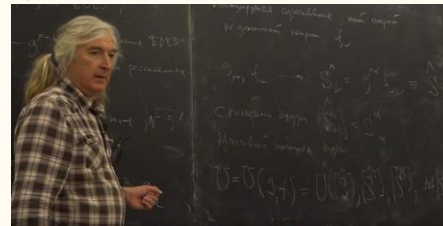
- **Selected topics in the theory of condensed matter. Parts 1-2** - Alexey N. Rubtsov (RQC & Faculty of Physics MSU), Evgeny A. Polyakov (RQC)
- **Hamiltonian mechanics and classical integrable systems** - Lecturer: Andrei V. Zotov (Steklov Mathematical Institute of RAS)
- **Lie groups and algebras and classical integrable systems** - Khazret S. Nirov (NRU HSE & INR RAS)
- **Hamiltonian approach to general relativity and its applications in modern models of gravity** - Д.Ф.-М.Н. Andrey O. Barvinsky (LPI RAS)

VIDEO LECTURES

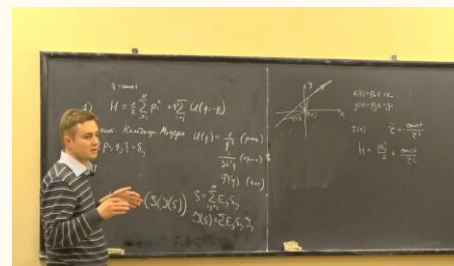
Available here:

itmp.msu.ru/studentam/videolekczii

1. Professor at the Université de Tours (France), **Mikhail S. Volkov**



1. Lead Researcher at the Steklov Mathematical Institute of RAS, **Andrei Zotov**



Events

February 1-9,
2020

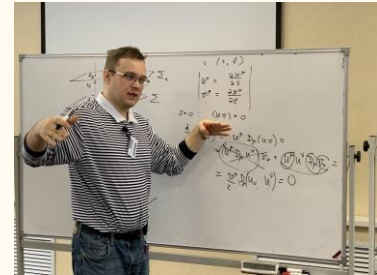


Winter School

ИТМФ
МГУ

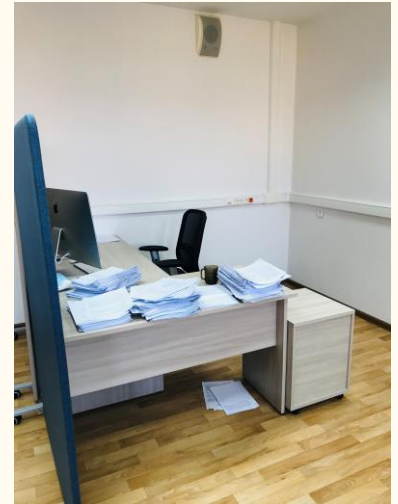
ITMP Winter School in theoretical and mathematical physics for students of 3-4 years.

- **60** students applied
- **36** selected students and **5** lecturers
- Students from **7** leading Russian universities (MSU, SPbU, MIPT, MEPHI, etc.)
- **5** lectures and **38** practical classes
- **16** students invited for an interview for joint Master's program with the Faculty of Physics MSU



Working Environment

ITMP has several furnished classrooms and open-space offices for comfortable working environment.





* ITMP is supported by the Theoretical Physics
and Mathematics Advancement Foundation
«BASIS»

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