



**Federal State Budgetary Educational Institution of Higher Education  
LOMONOSOV MOSCOW STATE UNIVERSITY  
FACULTY OF PHYSICS**

Program approved  
Academic Council  
Lomonosov Moscow State University  
Protocol No. \_\_\_\_\_ dated \_\_\_\_\_

**TRAINING PROGRAM FOR SCIENTIFIC AND SCIENTIFIC AND PEDAGOGICAL STAFF IN  
POSTGRADUATE STUDIES (postgraduate program)  
implemented in a network form  
by M.V. Lomonosov Moscow State University  
and Shenzhen MSU-BIT University**

**Scientific specialty:** 1.3.6. Optics

**The focus of the program:** physical and mathematical sciences

**Structural subdivision of Moscow State University implementing the postgraduate program:** Faculty of Physics at M.V. Lomonosov Moscow State University, Faculty of Materials Sciences at Shenzhen MSU-BIT University

**Name and code of the postgraduate program:**

**1.3.6. Optis  
(103-01/02-01-136-phms)**

Draft program  
Approved by the Academic Council  
Faculty of Physics  
Lomonosov Moscow State University  
Protocol No. 6 dated on June, 29<sup>th</sup> 2023

**MOSCOW 2023**

## General description

### 1. General information about the PhD program

**1.1.** The program for the training of scientific and scientific-pedagogical personnel in graduate school (hereinafter referred to as the Postgraduate Program), implemented in a network form jointly between M.V. Lomonosov Moscow State University and the Shenzhen MSU-BIT University (PRC) in the scientific specialty 1.3.6. "Optics", physical and mathematical sciences, is a system of documents developed and approved by the Academic Council of M.V. Lomonosov Moscow State University (hereinafter - MSU) in accordance with the requirements of the legislation of the Russian Federation and local regulations of MSU:

- Federal Law No. 273-FZ of December 29, 2012 "On Education in the Russian Federation";
- Order of the Ministry of Science and Higher Education of the Russian Federation dated 10/20/2021 No. 951 "On approval of Federal State requirements for the structure of training programs for scientific and scientific-pedagogical personnel in graduate school (Adjunct), the conditions of their implementation, the timing of the development of these programs, taking into account different forms of education, educational technologies and the characteristics of certain categories of graduate students (adjuncts)";
- Decree of the Government of the Russian Federation dated 11/30/2021 No. 2122 "On Approval of the Regulations on the training of scientific and scientific-pedagogical personnel in postgraduate studies (adjunct)";
- Requirements for the basic training programs for scientific and scientific-pedagogical personnel in graduate school, independently established by Lomonosov Moscow State University (Order No. 1216 of November 24, 2021)
- Agreement on the implementation of educational programs of higher education - programs of scientific and pedagogical personnel training in graduate school in network form jointly by Lomonosov Moscow State University and the Shenzhen MSU-BIT University
- Other local regulations.

The postgraduate program includes a scientific and educational component, represented by the following set of documents: a general description of the program, a plan of scientific activity, a curriculum, a calendar study schedule, work programs of disciplines (modules), an internship program. This program has an orientation reflected in the code of the program "phms", meaning that the dissertation is being prepared in the physical and mathematical sciences.

The result of scientific (research) activities under this educational program is a prepared theses for the scientific degree of Candidate of Sciences for defense.

**1.2. The volume of the educational component of the postgraduate program:** 15 credit units (hereinafter referred to as CU).

**1.3. Form (forms) of education:** full-time, with the use of distance technologies.

**1.4. Duration of education:** 4 years

**1.5. Language(s) of education:** Russian, English

**1.6. Code and name of the scientific specialty in which the postgraduate program is being implemented:**  
1.3.6. Optics

**1.7. Branches of science in which defenses are possible after mastering this postgraduate program:**  
physical and mathematician.

**1.8. Dissertation councils where it is possible to defend a dissertation for the degree of candidate of sciences:** – MSU.013.6(01.08); (MSU)

– 24.1.262.01 (D 002.023.03) (FSBIS Lebedev Physical Institute RAS);

– 24.1.123.01 (D 002.014.01) (FSBIS Institute of spectroscopy RAS);

– other dissertation councils in the system of the Higher Attestation Commission (HAC), which have been granted the right by the Ministry of Education and Science of the Russian Federation to accept dissertations for the defense of Candidate of Sciences degree in specialty 1.3.6. "optics" in the field of physical and mathematical sciences.

**1.9. Features of the postgraduate program.**

The Faculty of Physics of M.V. Lomonosov Moscow State University implements a postgraduate program in a network form in cooperation with the Faculty of Materials Science of the Shenzhen MSU-BIT University (PRC) (SMBU). Studying under this program allows one to gain experience in working in an international team, which will have a positive effect on your curriculum vitae and will favor employment both in Russia and abroad. Features of training are access to unique scientific equipment available at the SMBU. The program focuses not only on experimental methods for the optical characterization of objects, but also on the creation and synthesis of research subjects - resonant nanophotonic structures. PhD students spend part of their study time at the SMBU, where they create samples, and part in Moscow, where they are engaged in optical measurements and characterization of the obtained objects - the subjects of their theses.

## **2. Conditions for the implementation of the postgraduate program.**

**2.1. Structural unit where the program is implemented:** Faculty of Physics, M.V. Lomonosov Moscow State University; Faculty of Materials Sciences, Shenzhen MSU-BIT University.

**2.2. Actual address(es) of the program implementation:** base unit - 119991, Moscow, Leninskiye Gory 1, building 2, participant's unit - 518172, People's Republic of China, Shenzhen, Guangdong Province, Longgang District, Dayunxinchen, Guojidaxueyuan Street, 1

**2.3 The maximum possible number of graduate students simultaneously studying in this program:** 12 places, excluding persons on academic leave or maternity / parental leave.

**2.4. Personnel conditions for the implementation of the program:** Appendix 1 to the program.

**2.5. Material and technical conditions for the implementation of the program:** Appendix 2 to the program.

**2.6. Information and educational and methodological support of the program:** Appendix 3 to the program

**I. SCIENTIFIC COMPONENT**  
**Plan of scientific activity of the PhD program**  
*1.3.6. Optics*  
*(103-01/02-01-136-phms)*

Scientific (research) activities under this educational program are aimed at preparing a theses for the scientific degree of Candidate of Sciences for defense and includes conducting scientific research, preparing publications that present the main scientific results of the theses, in peer-reviewed scientific publications, equivalent to scientific publications indexed in the international databases Web of Science and Scopus and international databases determined in accordance with the recommendation of the Higher Attestation Commission under the Ministry of Science and Higher Education of the Russian Federation, as well as in scientific publications indexed in the database Russian Science Citation Index (RSCI), and (or) applications for patents for inventions, utility models, industrial designs, breeding achievements, certificates of state registration of programs for electronic computers, databases, topologies of integrated circuits.

	<b>Stages of Mastering the Scientific Component of the Postgraduate Program and Final Attestation</b>	<b>Year of study (course)</b>	<b>Results</b>
<b>1. Sample research plan</b>			
1.1.	Justification of the research topic, taking into account the requirements: <i>Passports of scientific specialty, Regulations on the award of academic degrees (Decree of the Government of the Russian Federation of September 24, 2013 No. 842)</i>	1	Order of the organization on the approval of the dissertation topic in the framework of postgraduate programs and the main directions of the organization's research activities
1.2.	Definition of tasks, stages, research methods and forms of organization of its implementation.	1	Individual plan of scientific activity of a postgraduate student
1.3.	Realization of research - building theoretical models - numerical simulation - pilot study - sample fabrication	1, 2, 3, 4	- results of experiments, graphs, analysis, - theoretical model formulas - graphs of numerical simulation - images from microscopes, scientific cameras - applying for grants - participation in grants - internships
1.4.	Approbation of the research results - participation in international conferences	1, 2, 3, 4	- international conference on optics, oral and poster presentations on the research topic

	- participation in Russian conferences - presentations at seminars		- Russian conferences on optics, oral and poster presentations on the research topic
1.5.	Certification by stages of scientific research	1, 2, 3, 4	Postgraduate student's report at a meeting of the Department of Nanophotonics, Faculty of Physics, Moscow State University. Feedback from the supervisor on the stages of research activities carried out by the postgraduate student
<b>2. Plan for the preparation of the thesis and publications</b>			
2.1.	Substantiation of the dissertation structure	1, 2	Presentation of a postgraduate student with a report at a collective discussion, initial review of the report by the supervisor
2.2.	Formation of sections and chapters of the dissertation	1, 2, 3	Presentation of a postgraduate student with a report at a collective discussion, initial review of the report by the supervisor
2.3.	Preparation of a dissertation in accordance with the requirements of the Regulations on the award of academic degrees (Decree of the Government of the Russian Federation of September 24, 2013 No. 842)	3, 4	Dissertation, initial review of the dissertation by the supervisor
2.4.	Preparation of publications (other types of patents in accordance with paragraph 5 of the FGT, taking into account the specifics of the specialty)	2, 3, 4	Publications and / or certificates of acceptance for publication (applications for patents)
<b>3. Final certification</b>			
3.1.	Presentation of the dissertation to the department, to the scientific department for the appointment of reviewers	4	Feedback from the supervisor
3.2.	Dissertation review by internal and/or external reviewers	4	At least 2 reviews
3.3.	Evaluation of the dissertation for its compliance with the criteria established in accordance with the Federal Law "On Science and State Technical Policy" at the department, in the scientific division, in the interdepartmental association, etc. (the number of discussions is determined by the organization)	4	Commission meeting protocol

3.4.	Preparing a conclusion based on the results of the dissertation evaluation	4	Conclusion on the compliance of the dissertation with the criteria established in accordance with the Federal Law "On Science and State Scientific and Technical Policy"
------	--	---	--

## II. EDUCATIONAL COMPONENT

Curriculum of the postgraduate program 1.3.6. Optics (103-01/02-01-136-phms)

Stages of Mastering the Educational Component of the Postgraduate Program	Course (year of study)	Total labor intensity, hours/credits	Contact work, hour	Independent work, hour	Form of intermediate certification	
<b>1</b>	<b>Disciplines (modules) aimed at preparing for candidate exams</b>					
1.1	History and philosophy of science	1	108/3	102	6	Admission to the candidate exam
1.2	Foreign language	1	108/3	72	36	Admission to the candidate exam
1.3	Speciality	3	108/3	54	54	Admission to the candidate exam
<b>2</b>	<b>Compulsory Disciplines (modules)</b>					
2.1	General university discipline*	1	36/1	20	16	Credit
2.2	General scientific course "Fundamentals of organization of scientific work"	1	72/2	42	30	Credit
<b>3</b>	<b>PhD exams</b>					
3.1	History and philosophy of science	1	36/1	6	30	candidate exam
3.2	Foreign language	1	36/1	6	30	candidate exam
3.3	Speciality	3	36/1	6	30	candidate exam
<b>TOTAL</b>			<b>540/15</b>	<b>308</b>	<b>232</b>	

\* The system of state training and certification of scientific and pedagogical personnel in Russia (opportunities, rights and obligations of graduate students).

## Calendar study schedule for the postgraduate program

### 1.3.6. Optics (103-01/02-01-136-phms)

**Scientific specialty:** 1.3.6. Optics

**Structural subdivision:** Faculty of Physics

Year of study	October					November				December					January					February					March					April					May					June				July					August					September				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52						
1	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC					
2	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC									
3	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC	EC SC									
4	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC	SC			

### Legend

**SC** - Scientific component, including scientific activities aimed at preparing a dissertation for defense, preparing publications and (or) applications for patents for inventions, utility models, industrial designs, selection achievements, certificates of state registration of programs for electronic computers, databases, topologies of integrated circuits;

**ICSC** - intermediate certification for the scientific component

**EC** - An educational component that includes disciplines (modules) aimed at preparing for the candidate's examinations, other disciplines (modules) and intermediate certification on them, practice and intermediate certification on it;

**CE** - candidate exams

**V** - vacation

**FC** - final certification



**List of scientific supervisors of this program:**

№	Name	Degree	Rank	Experience of scientific supervision (years)	The number of postgraduate students who defended their dissertations under supervision from 2017 to the present	The number of postgraduate students preparing dissertations under scientific supervision to date
1.	Fedyanin Andrey Anatolievich	Doctor of Science	Professor	12	9	6
2.	Lukyanchuk Boris Semyonovich	Doctor of Science	Professor	5	0	1
3	Bessonov Vladimir Olegovich	PhD	No	10	0	0
4	Shorokhov Alexander Sergeevich	PhD	No	5	0	0
5	Musorin Alexander Igorevich	PhD	no	3	0	2

**List of scientific and pedagogical personnel providing the implementation of the educational component of the program**

№	Discipline/module, practice	Name	Degree	Rank	Pedagogical experience (years)
<b>1.</b>	<b>Disciplines (modules) aimed at preparing for candidate exams.</b>				
1.1	History and philosophy of science	Grishunin S.I.	Doctor of Science	Professor	28
		Varkhotov T.A.	PhD	Assistant professor	18
		Khmelevskaya S.A.	Doctor of Science	Professor	36
		Erekaev V.D.	PhD	Assistant professor	24

		Yakovlev V.A.	Doctor of Science	Professor	47
1.2	Foreign language	Kovalenko I.Yu.	PhD	Assistant professor	20
		Andreeva S.V.	PhD	Assistant professor	37
		Borodina A.V.			34
		Vorobyova E.V.			29
		Kiseleva L.A.			13
		Kolubelova V.A.			24
		Kuzicheva M.V.	PhD		26
		Moiseeva T.Yu.			29
		Plotnikova A.V.	PhD		30
		Popravko E.S.			32
		Shlyakhova O.D.			49
1.3	Speciality	Kosareva O.G.	Doctor of Science	Assistant professor	32
		Saletsky A.M.	Doctor of Science	Professor	35
		Kolmychek I.A.	Doctor of Science	Assistant professor	11
		Naniy O.E.	Doctor of Science	Professor	23
<b>2.</b>	<b>Mandatory Disciplines (modules)</b>				
2.1	Interdisciplinarity of scientific knowledge in research at Moscow University	Auzan A.A.	Doctor of Science	Professor	46
		Matskeplishvili S.T.	Doctor of Science	Professor, RAS corresponding member	25
		Antipov E.V.	Doctor of Science	RAS corresponding member	30
2.2	Fundamentals of organization of scientific work	Rozanov V.V.	Doctor of Science	Assistant professor	47
<b>3.</b>	<b>PhD exams</b>				
3.1	History and philosophy of science	Grishunin S.I.	Doctor of Science	Professor	28
		Varkhotov T.A.	PhD	Assistant professor	18
		Khmelevskaya S.A.	Doctor of Science	Professor	36
		Erekaev V.D.	PhD	Assistant professor	24
		Yakovlev V.A.	Doctor of Science	Professor	47

3.2	Foreign language	Kovalenko I.Yu.	PhD	Assistant professor	20
		Andreeva S.V.	PhD	Assistant professor	37
		Borodina A.V.			34
		Vorobyova E.V.			29
		Kiseleva L.A.			13
		Kolubelova V.A.			24
		Kuzicheva M.V.	PhD		26
		Moiseeva T.Yu.			29
		Plotnikova A.V.	PhD		30
		Popravko E.S.			32
		Shlyakhova O.D.			49
3.3	Speciality	Kosareva O.G.	Doctor of Science	Assistant professor	32
		Saletsky A.M.	Doctor of Science	Professor	35
		Kolmychek I.A.	Doctor of Science	Assistant professor	11
		Naniy O.E.	Doctor of Science	Professor	23

**Appendix 2**  
To PhD program  
*1.3.6. Optics (103-01/02-01-136-phms)*

**Logistics support  
educational activities according to the educational program**

N	Name of academic subjects, courses, disciplines (modules), practice, other types of educational activities provided for by the curriculum of the educational program	Name of equipped classrooms, facilities for conducting practical classes, physical education and sports facilities with a list of main equipment	Address (location) of classrooms, facilities for practical training, physical education and sports facilities (indicating the area and room number in accordance with the documents of the technical inventory bureau)	Ownership or operational management, economic management, lease (sublease), gratuitous use, practical training	Full name of the owner (lessor, lender) of the real estate property	Document - the basis for the emergence of rights and (details and validity period)
1	2	3	4	5	6	7
1.	A discipline aimed at preparing for passing the candidate exam in history and philosophy of science	Audience for lectures: 200 work seats, chalk board, laptop, multimedia, projector, screen	119234, Russia, Moscow, Leninskie Gory, 1, building 2, room. 5-19 (112 sq.m.)	Operational management	Russian Federation	Extract from the Unified State Register of Real Estate dated May 18, 2018 No. 77/100/379/2018-1842 indefinitely
2.	A discipline aimed at preparing for passing the candidate exam in a foreign language	Audience for lectures and seminars: 32 work seats, universal board, laptop, multimedia projector, stationary screen	119234, Russia, Moscow, Leninskie Gory, 1, building 2, room. 5-48 (34 sq.m.)	Operational management	Russian Federation	Extract from the Unified State Register of Real Estate dated May 18, 2018 No. 77/100/379/2018-1842 indefinitely

		Audience for lectures and seminars: 32 work seats, universal board, laptop, multimedia projector, stationary screen	119234, Russia, Moscow, Leninskie Gory, 1, building 2, room. 5-37 (23 sq.m.)	Operational management	Russian Federation	Extract from the Unified State Register of Real Estate dated May 18, 2018 No. 77/100/379/2018- 1842 indefinitely
		Audience for lectures and seminars: 15 work seats, universal board, laptop, multimedia projector, portable screen	119234, Russia, Moscow, Leninskie Gory, 1, building 2, room. 5-41 (28 sq.m.)	Operational management	Russian Federation	Extract from the Unified State Register of Real Estate dated May 18, 2018 No. 77/100/379/2018- 1842 indefinitely
3.	A discipline aimed at preparing for passing the candidate exam in the specialty (1.3.6 Optics)	Audience for lectures: 200 work seats, chalk board, laptop, multimedia, projector, screen	119234, Russia, Moscow, Leninskie Gory, 1, building 2, room. 5-19 (112 sq.m.)	Operational management	Russian Federation	Extract from the Unified State Register of Real Estate dated May 18, 2018 No. 77/100/379/2018- 1842 indefinitely
4.	Candidate's exam in history and philosophy of science	Audience for lectures: 200 work seats, chalk board, laptop, multimedia, projector, screen	119234, Russia, Moscow, Leninskie Gory, 1, building 2, room. 5-19 (112 sq.m.)	Operational management	Russian Federation	Extract from the Unified State Register of Real Estate dated May 18, 2018 No. 77/100/379/2018- 1842 indefinitely

5.	Candidate's exam in foreign language	Audience for lectures and seminars: 32 work seats, universal board, laptop, multimedia projector, stationary screen	119234, Russia, Moscow, Leninskie Gory, 1, building 2, room. 5-48 (34 sq.m.)	Operational management	Russian Federation	Extract from the Unified State Register of Real Estate dated May 18, 2018 No. 77/100/379/2018-1842 indefinitely
6.	Candidate's exam in the specialty (1.3.6 Optics)	Audience for lectures: 200 work seats, chalk board, laptop, multimedia, projector, screen	119234, Russia, Moscow, Leninskie Gory, 1, building 2, room. 5-19 (112 sq.m.)	Operational management	Russian Federation	Extract from the Unified State Register of Real Estate dated May 18, 2018 No. 77/100/379/2018-1842 indefinitely
7.	General scientific discipline	Audience for lectures: 200 work seats, chalk board, laptop, multimedia, projector, screen	119234, Russia, Moscow, Leninskie Gory, 1, building 2, room. 5-19 (112 sq.m.)	Operational management	Russian Federation	Extract from the Unified State Register of Real Estate dated May 18, 2018 No. 77/100/379/2018-1842 indefinitely
8.	University discipline (Interdisciplinarity of scientific knowledge in research at Moscow University)	Audience for lectures: 200 work seats, chalk board, laptop, multimedia, projector, screen	119234, Russia, Moscow, Leninskie Gory, 1, building 2, room. 5-19 (112 sq.m.)	Operational management	Russian Federation	Extract from the Unified State Register of Real Estate dated May 18, 2018 No. 77/100/379/2018-1842 indefinitely

9.	Scientific component	<ul style="list-style-type: none"> <li>-Confocal microscope</li> <li>- optical table</li> <li>- Femtosecond laser</li> <li>- Parametric light generator</li> <li>- Photodiode</li> <li>- Photomultiplier tube</li> <li>- Spectrometer</li> <li>- Computer</li> <li>- Experiment automation system</li> </ul>	119234, Russia, Moscow, Leninskie Gory, 1, building 35, room. 1-01a (25m2)	Operational management	Russian Federation	Extract from the Unified State Register of Real Estate dated May 18, 2018 No. 77/100/379/2018-1842 indefinitely
		<ul style="list-style-type: none"> <li>- Clean room</li> <li>- Optical table</li> <li>- Computer</li> <li>- Experiment automation system</li> <li>- Femtosecond laser system</li> <li>- Optical probe station</li> </ul>	119234, Russia, Moscow, Leninskie Gory, 1, building 35, room. 221 (50 m2)	Operational management	Russian Federation	Extract from the Unified State Register of Real Estate dated May 18, 2018 No. 77/100/379/2018-1842 indefinitely
		<ul style="list-style-type: none"> <li>- Femtosecond titanium-sapphire oscillator</li> <li>- Optical table</li> <li>- Computer</li> <li>- Experiment automation system</li> <li>- Optical cryostat</li> <li>- Monochromator-spectrograph with high spectral resolution for retrofitting the spectroscopic complex</li> </ul>	119234, Россия, Москва, Ленинские горы, д. 1, стр. 35, ауд. П-34 (30м2)	Operational management	Russian Federation	Extract from the Unified State Register of Real Estate dated May 18, 2018 No. 77/100/379/2018-1842 indefinitely
		<ul style="list-style-type: none"> <li>- Two-photon laser printing</li> <li>- Optical table</li> <li>- Computer</li> <li>- Experiment automation system</li> <li>- Scanning electron microscope</li> <li>- pull out drobe</li> <li>- Plasma-chemical purification set-up</li> <li>- refrigerator</li> </ul>	119234, Russia, Moscow, Leninskie Gory, 1, building 35, room. P-41 (20m2)	Operational management	Russian Federation	Extract from the Unified State Register of Real Estate dated May 18, 2018 No. 77/100/379/2018-1842 indefinitely

	<ul style="list-style-type: none"> <li>- Spectrophotometer for UV and visible region</li> <li>- Energy dispersive X-ray fluorescence spectrometer</li> <li>- Vortex mixer</li> <li>- Analytical balances</li> <li>- Electrical conductivity meter</li> <li>- Tabletop tablet press</li> <li>- Portable digital microscope</li> <li>- Portable digital microscope</li> <li>- Tabletop high-speed, large-capacity cooling centrifuge</li> <li>- Benchtop centrifuge for test tubes</li> <li>- Fridge</li> </ul>	518172, People's Republic of China, Guangdong Province, Shenzhen, Longgang District, Dayunxincheng, Guojidaxueyuan Street, Laboratory Building 1, room. 215, area 20 sq.m.	Free use	Shenzhen People's Government	Founding agreement between Lomonosov Moscow State University and Beijing Polytechnic Institute on the creation of the Shenzhen MSU-BIT University on September 5, 2014
	<ul style="list-style-type: none"> <li>- Fluorescence spectrometer</li> <li>- Spark optical emission spectrometer</li> <li>- Inductively coupled plasma emission spectrometer</li> <li>- Portable laser spark emission spectrometer</li> <li>- Gas chromatograph</li> <li>- Liquid chromatograph</li> <li>- Gas generator system (hydrogen, nitrogen, air)</li> <li>- Ion chromatograph</li> <li>- Thin layer chromatograph</li> <li>- Handheld spectrometer Nir</li> </ul>	518172, People's Republic of China, Guangdong Province, Shenzhen, Longgang District, Dayunxincheng, Guojidaxueyuan Street, Laboratory Building 1, room. 210, area 42 sq.m.	Free use	Shenzhen People's Government	Founding agreement between Lomonosov Moscow State University and Beijing Polytechnic Institute on the creation of the Shenzhen MSU-BIT University on September 5, 2014
	<ul style="list-style-type: none"> <li>- Fourier transform IR spectrometer / IR microscope</li> <li>- Analytical balances</li> <li>- Comprehensive thermal analyzer</li> <li>- Differential scanning calorimeter</li> <li>- Dynamic thermomechanical analyzer</li> <li>- Nanoparticle size and zeta potential analyzer</li> </ul>	518172, People's Republic of China, Guangdong Province, Shenzhen, Longgang District, Dayunxincheng, Guojidaxueyuan Street, Laboratory Building 1, room. 108, area 48 sq.m.	Free use	Shenzhen People's Government	Founding agreement between Lomonosov Moscow State University and Beijing Polytechnic Institute on the creation of the Shenzhen MSU-BIT



		- Overhead agitator - Mini centrifuge				University on September 5, 2014
		- Raman microscope	518172, People's Republic of China, Guangdong Province, Shenzhen, Longgang District, Dayunxincheng, Guojidaxueyuan Street, Laboratory Building 1, room. 111, area 18 sq.m.	Free use	Shenzhen People's Government	Founding agreement between Lomonosov Moscow State University and Beijing Polytechnic Institute on the creation of the Shenzhen MSU-BIT University on September 5, 2014

**Certificate of information and educational and methodological support for the implementation of the program**

The Faculty of Physics provides postgraduate students the access to research facilities in accordance with the Postgraduate Program and individual work plan. Ensuring the effective activities of postgraduate students and faculty members in the realization of this postgraduate program includes, among other things, the opportunity to:

– creation, search, collection, analysis, processing and presentation of information (working with texts in paper and electronic form, recording and processing images and sound, speeches with audio, video and graphic accompaniment, communication on the Internet) – provides wireless access to Internet via WiFi in faculty buildings; availability of video conferencing systems.

– placement and preservation of information resources and educational materials used by participants in the educational process, intended for the educational activities of students;

– monitoring the progress and results of the educational process, recording the results of the activities of students and teaching staff - the AIS postgraduate system;

– remote interaction of all participants in the educational process: postgraduate students and teachers, scientific supervisors, faculty and university administration, methodological services, the public, organizations exercising management in the field of education through:

- the official website of the faculty and the official website of the university,
- personal or corporate email,
- the graduate student's personal account, in a special communication environment,
- university-wide MS Teams system,
- holding ZOOM conferences, free-conference, meat-conference, using the BigBlueButton platform, etc;

– access to all funds of the Scientific Library of M.V. Lomonosov Moscow State University - a separate division within the structure of the university, including access to online libraries, such as eLibrary, infostat.ru, university information system RUSSIA, electronic library dissertations of the Russian State Library;

– access to the funds of the faculty library with a full range of library services, equipped with textbooks for all basic courses recommended in the Work Programs of General Scientific, Compulsory and Optional Disciplines of the Postgraduate Program,

– access to sources of information and thematic libraries collected at the departments of the faculty from special (scientific and methodological) literature necessary for organizing and realizing scientific activities.