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PHYSICS: Improvement of master-level education in the field of physical sciences in Belarusian universities

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Dissemination and Exploitation Plan

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Executive Summary

A well designed and implemented dissemination and exploitation plan is imperative to ensure that the project initiatives and outcomes are promoted and generate the required impact. Both the short-term and long-term outcomes of the project such as the educational initiatives undertaken and the newly generated knowledge, the social and pedagogical implications are important for delivering high quality education, master-study module programs, the development of ICT-based teaching, and preparing Belarusian students to compete in the field. Consequently, the dissemination and exploitation activities need to be further highlighted in a project Dissemination and Exploitation plan.

This document, which is entitled “Dissemination and Exploitation Plan,” is designed to report the current and planned dissemination and exploitation activities within PHYSICS. This report has been structured to provide a general description of the dissemination and exploitation plan, a description of the project’s anticipated outcomes, a list of the participating organizations, and other-related dissemination and exploitations tools that will be utilized to raise awareness about the project and its broader pedagogical and social impact for Belarusian students and the participating academic institutions. The dissemination and exploitation plan also offers a synoptic view on the actions already undertaken and future actions that will be undertaken to promote further the project and its outcomes.

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1. Introduction

This document presents the Dissemination and Exploitation Plan of the Physics project, devised at the start of the project and revised throughout the duration of the project. The document is intended to be used as a point of reference and a guide for the dissemination and exploitation activities undertaken by the consortium partners in order to promote the project, its outcomes, and ensure that quality results were delivered on time. This report is imperative in order to ensure that all actions are realized in a timely manner and the quality of the tasks are met according to the high standards set by the project coordinator and participating partners. The overall objectives of WP5 (Dissemination and Exploitation) are summarized as follows:

- Identify **key stakeholders** in the field for targeted dissemination of project objectives and outcomes
- Arrange **information sessions** to attract students and inform stakeholders
- Develop a **valorisation strategy** that includes dissemination and exploitation plans and a communication strategy that can maximize project impact
- Disseminate and exploit the project activities and results **using virtual forums and other social networking sites**, such as Facebook and LinkedIn
- Disseminate the development of **innovative ICT-based teaching and learning environments** at a local and national level
- Work with project partners to disseminate the project objectives and outcomes **at a national level**
- Use **media coverage (TV and radio broadcasts) and press releases** to build the project's reputation
- Develop an **accessible project website** as key valorisation tool
- **Produce posters and leaflets** for higher impact among students and faculty at participating academic institutions
- **Plan a seminar for main stakeholders** (universities, NGO, associated partners)
- Organize a **final conference** to promote project results and promotion of stakeholders, education authorities and industry representatives
- Develop a **project logo** to increase project visibility
- **Develop and disseminate five e-books** for training master-level students in the field of physical sciences to enhance project visibility.

The above general objectives are discussed in more detail in the specific objectives of the dissemination and exploitation plan in the following subsection.

1.1. Objectives of the dissemination and exploitation plan

The dissemination and exploitation activities within the Physics project have the following objectives:

- Clearly define and ensure the successful realization of the project objectives, outcomes and tangible results, as defined in the project
- Identify and reach the target groups both at the local and national level, such as the academic faculty, students, professional associations, the ministry of education in Belarus, and other associated partners
- Set up a strategy and propose specific actions to promote awareness about the project and its expected outcomes to organizations at a local, national, and European level
- Set up a strategy and propose actions for building a clear understanding of the pedagogical, institutional, and social implications of the project to Belarus and to the wider European community
- Set up a strategy and propose actions that will aim at engaging the Belarusian and European community in the activities of the project
- Set up a strategy and propose actions that will ensure a high impact, dissemination and exploitation, and sustainability of the project and its expected outcomes.

1.2. Methodology of the dissemination and exploitation plan

The dissemination and exploitation plan is coordinated by the indicated associated partners, the University of Cyprus, but all consortium partners are invited to actively contribute to the realization of all dissemination and exploitation activities of the project. Multiple dissemination and exploitation activities are undertaken. Among these activities, the following are distinguished:

- Develop a **Dissemination and Exploitation Plan** (through the present document)
- Stimulate **media interest**, local press, TV, radio, and social networking sites. Disseminate the project's objectives and outcomes through eighteen planned media publications and press releases, four TV and radio broadcasts, and three press conferences
- Design and display **posters at Belarusian universities** where the equipment and software will be installed
- Design and distribute **leaflets** to promote the project objectives and outcomes

- Participate in **conferences and publish papers** in high impact journals
- Conduct **a seminar for main stakeholders** (universities, NGOs, associated partners)
- Create and maintain an **accessible project website**. Google analytics will be used to record traffic to the website
- Design **a project logo** to promote the project
- Plan **information sessions** to attract students and to inform stakeholders, three sessions by each EU and Belarusian university (3x6= 18, BSU and BSTU common sessions in Minsk)
- Organize **a final conference** to disseminate the project results evaluation to stakeholders, education authorities and the industry representatives.

In addition, further actions will be undertaken to elaborate and sign Double-sided agreements for cooperation between project partners during and beyond the completion of project. Consortium partners will agree that newly produced educational materials will be freely accessible through the use of open licences. Elaboration of Study and Recommendation Documents for new training programs will also be introduced in order to ensure that practice-oriented, master-level programmes in Belarusian universities will be in compliance with ECTS principles beyond the completion of the project. Based on Study and Recommendations, the preparation and adjustments of new master-level programs for the second year will continue to be tested beyond the end of the project.

2. Overview of Physics Aims and Objectives

Physics aims to reform the current Belarusian higher education system according to the Bologna process. The topics of the curricula will be developed and transformed to comply with ECTS standards in order to facilitate the transfer of credits and the implementation of bilateral contracts related to the content and organisation of study programmes.

The goal is to upgrade master-level education in the field of physics (functional nanomaterials, photonics and applied physics) in four Belarusian universities according to the Bologna practices. The consortium members will strive to undertake actions that will enhance the quality and relevance of education through the use of newly created study programs, ICT, and networking activities that will help students meet the needs for the labour market.

The main specific objectives of the project are:

1. To develop modern master-level programs in the field of functional nanomaterials, photonics and applied physics, which respects principles of the Bologna process, and to implement it at four Belarusian universities;

2. To develop and update courses and teaching materials for two master-level model educational programs, Functional nanomaterials and Photonics;
3. To improve teachers' qualifications and skills;
4. To improve Belarusian academic staff competences for teaching of newly developed courses in English;
5. To implement a modern technical infrastructure for teaching and learning;
6. To develop an innovative ICT-based teaching and learning environment;
7. To bring the Belarusian Higher Education Institutions closer to the Labour Market needs;
8. To introduce to the faculty the ICT skills that are required for new graduates to break their way into the industries and scientific institutions.

The studies and workshops to define specific needs of the labour market in the field of functional nanomaterials and photonics will be conducted. The studies will be completed with the active contribution of the Belarusian Association of Nanoindustry, the Belarusian Physical Society, the Ministry of Education and associated partners.

Cooperation between European and Belarusian universities and industry will be imperative in order to define the particular industry needs and trends and ensure the industry's critical input in the development of training programs. The results of the project will promote further collaboration between HEIs, NGOs and business and will equip students with the required skills and knowledge to compete in the domain of physics, including functional nanomaterials, photonics, electrical engineering, electricity and magnetism.

More specifically, acquisition of practice-oriented curricula and modules in the field of functional nanomaterials and photonics will be supported by virtual laboratories and dedicated hardware and software platforms.

3. Consortium Organization Profiles

The Physics consortium consists of ten members as described below. There is a mix of expertise at national and international level that brings academic and industrial competence to the project and experienced research institutions with an excellent research record.

To highlight the variety of knowledge and experience brought into the project, participating organisations are described in more detail, placing particular emphasis on their activities and achievements.

3.1. Riga Technical University

Riga Technical University (RTU) has a proud history of providing education over 150 years. At present RTU is one of the oldest and largest technical universities in the Baltic Sea region it gathers nearly 16,000 students at eight faculties in various study programmes. Along with local students, the university is a home for students from around 30 countries, which number grows constantly. RTU plays an active role in Socrates/ERASMUS and developed links involving over 120 education institutions across Europe and beyond. Proficient and competitive academic staff carry out academic education. RTU is also registered as research organisation. Its research capacity includes 30 laboratories, 33 institutes, 103 departments, divisions, and more than 440 researchers. RTU created four National Research Centres, such as Nanostructured and multifunctional materials, design and technology, Energy and environment and sustainable resource extraction the use of technology, Pharmaceutical and biomedical and Information, communications and signal processing technology NRC. RTU developed new nanotechnologies and products, such as Nanostructured catalysers for biodiesel production, Water treatment technology with nanostructured ceramic and other products. RTU takes part in by state financed programs projects as well as in various international program projects: H2020, FP7, ARTEMIS, INTERREG, European Regional Development, European Social Fund etc. In year 2013, RTU implemented 78 projects with a total funding of 75 million euro.

3.2. KU Leuven University

Founded in 1425, the KU Leuven University is a centre of learning for almost 6 centuries. It is Belgium's largest and highest-ranked university and one of the oldest and most renowned European universities. It is home for 54,000 scholars (14% international from 140 countries, 4,000 doctoral students). KU Leuven works with high-quality partner institutions worldwide, stimulating purposeful mobility and research cooperation. As a leading European research university and co-founder of the League of European Research Universities (LERU), KU Leuven offers a wide variety of programmes in English supported by high-quality interdisciplinary research carried out at both the university and its internationally acclaimed hospitals. Boasting an outstanding central location in the heart of Europe, KU Leuven offers a truly international experience, high-quality education, excellent research and cutting-edge innovation. It continually strives to integrate the local and international student and research communities on all its campuses through a variety of programmes and activities.

The KU Leuven Faculty of Engineering Technology offers 3 Bachelor and 18 Master programmes and enrolls more than 6000 students. Students can follow a programme of choice at no less than 7 locations throughout Flanders. The Faculty ensures that the unique approach and quality of the programmes taught at each of these campuses is guaranteed, while bearing in mind common goals and interests.

Study fields cover biochemistry, biosciences, energy, electronics, ICT, plastics engineering, civil and electromechanical engineering.

The multi campus model makes the Faculty a dynamic and future-oriented study and research platform, where research is conducted in so-called technology clusters. Since 1989, the Faculty has a tradition in international projects, both as coordinator and as partner, guaranteeing a broad expertise to conduct international educational and research activities.

3.3. University of Cyprus – KIOS Research Center for Intelligent Systems and Networks

The University of Cyprus (UCY) is the leading public sector university in Cyprus with more than 7,000 students. UCY is the youngest institution to be ranked in the top 550 Higher Education Institutions in the world. Furthermore, it has been ranked the most active research institution in Cyprus (European Research Ranking 2012). UCY manages a budget of 50 million Euros & currently delivers up to 250 externally funded research projects, including FP7 projects and 10 ERC Grants. The University of Cyprus currently participates in over 20 projects funded by the Lifelong Learning Programme & Erasmus+.

The KIOS Research Centre for Intelligent Systems & Networks operates within UCY. KIOS aims to contribute to the advancement of knowledge in the areas of computational intelligence & intelligent networked embedded system design, & the application of these methodologies in monitoring, controlling, & optimizing the operation of large-scale complex systems. The Centre currently coordinates over €9 million in research funding, both from European & other sources. KIOS is a lead/active partner in several FP7 & other EU projects. It hosts a large ERC Advanced Grant (FAULT-ADAPTIVE) & is the coordinator of a number of EU projects. It was also the coordinator organisation for the ESF-COST Action "Intelligent Monitoring, Control & Security of Critical Infrastructure Systems (IntelliCIS)".

KIOS is a key partner in the large Network of Excellence Critical Infrastructure Preparedness & Resilience Research Network (CIPRNet). The Centre instigates interdisciplinary & multidisciplinary interaction & promotes collaboration between industry, academia & research organizations in high-tech areas of global importance. It boasts international research collaborations with 150 research organisations & companies (e.g., the Transmission Systems Operator, Electricity Authority of Cyprus, Cyprus Water Board & the Department of Communication & Works).

3.4. Belarusian State University

The BSU is the leading classical public University in Belarus. It includes 25 faculties, 4 educational institutions of retraining, Lyceum, Law College, 5 Research Institutes, 25 Scientific and Research

Centers, 12 unitary enterprises. The BSU's total enrolment exceeds 30 000 undergraduate students, 1000 Master and PhD students, which are trained by 56 specialties and 256 specializations. Now University provides training to more than 2 500 international students from 30 countries. Academic exchanges, common research and joint educational programs are realized in the framework of more than 200 international agreements with Institutions from the whole world. The BSU participates in many international projects, has a high intensity international academic mobility. As a leading university in Belarus, the BSU is acting as a center of international cooperation in education and science spheres being the place where innovations are being approved and then transferred to other universities.

3.5. Yanka Kupala State University of Grodno

Yanka Kupala State University of Grodno (YKSUG) is one of the most important regional educational and scientific centers of the Republic of Belarus. The university consists of 15 faculties and an Association of Socio-Humanitarian Departments, 1 institute, 4 colleges, Institute for Professional Skills Upgrading and Retraining, Regional Center for Testing and Youth Career Orientation. The University is a member of the European University Association (EUA), Eurasian University Association, participates in activities of the international network BSRUN and the Baltic University Program, develops new courses in order to join the Bologna Process and bring national higher education standards closer to the European recognition scheme.

3.6. Francisk Skorina Gomel State University

Francisk Skorina Gomel State University has 14 faculties and 52 departments where work 710 teachers, including 41 doctors, 31 professors, 250 candidates, 210 associate professors. The education of the students at the University is organized in 40 specialties and areas. The University has MA course (19 subjects), postgraduate study (56 subjects) and institution of doctoral (5 subjects), there are 4 thesis defence councils in six specialties, including one council - for doctoral theses defence.

Departments/Fields of Interest: Mathematics, Physics, Biology, Geology & Geography, Psychology and pedagogics, Foreign languages, History, Law, Economy, Physical culture, Philology, Teaching and learning of foreign students, Distance education, Advanced training and retraining.

The University consists of one research institute, 16 research laboratories involved in scientific research in various fields of knowledge, there is a Multiple-access Centre for environmental monitoring, equipped with unique scientific equipment. The university publishes a scientific journal "Proceedings of F.Skorina Gomel State University" and "Problems of physics, mathematics and engineering."

3.7. Belarusian State Technological University

Belarusian State Technological University is one of the leading educational and scientific centers of the Republic of Belarus. The University contains 10 faculties, 51 departments, 4 affiliates of departments, Negoreloye forestry experimental station, 29 educational-scientific centers that train about 13,000 students, 130 doctorates and post-graduates. Over 400 specialists of various branches of industry are annually provided with retraining and qualification upgrade courses. The University trains engineers for 28 specialties and 58 specializations; at the same time, the University trains highly qualified researchers doing Master's, PhD and Doctor Degree courses. In the last years, the university has formed numerous new partnerships with leading institutions around the world. The University is also committed to fostering an ever-evolving student body, curriculum, and campus life.

3.8. Belarusian Physical Society, Republic of Belarus

The Belarusian Physical Society (BPS) is a scientific voluntary association of citizens - researchers, professionals and students working in the field of physics and related fields of science. The aims of the BPS are to promote the development of physical science and physics knowledge dissemination, to improve the level of secondary and higher education in physics. In order to achieve the statutory objectives BPS establishes and develops contacts with scientists and scientific organizations in other countries, organizes conferences, meetings and scientific workshops on a variety of physical issues, long-term planning and forecasting the development of physical science. BPS is a member of the European Physical Society (EPS) and the Eurasian Physical Society (EAPS). Under the rule of the BPS two seminars are run: "Physics and Society" and "Application of spectral analysis in industry and research". Currently BPS unites members representing about 30 research organizations and universities in various cities of Belarus.

3.9. Ministry of Education of the Republic of Belarus

The national education of the Republic of Belarus has traditionally been one of the highest values of the Belarusian people. Evidence of the achieved results is the early implementation by the Republic of Belarus of a number of Millennium Development Goals, a high level of human development, ensuring political and socio-economic stability in the country.

Currently, there are over 8,000 educational institutions in the country representing all levels in which more than 3 million children, students, students and listeners provide education and upbringing to about 430,000 educational workers. The Republic of Belarus in the rating of the states on the index of human development on indicators in the sphere of education refers to states with a very high level of human development.

3.10. Republican Nanoindustry Association

RANI was founded in 2013. At present 23 organisations are the full members of Association. The Institutes of the National Academy of Sciences of Belarus, industry companies, SME majored in nanotechnology field, some universities, and science parks are among them. The main objective of RANI activity is the facilitating the successful development of the nanotechnology industry in the Republic of Belarus through the coordination and support of the cooperation of legal entities in relative field, representing their common interests at the level of government, on legal regulation in particular. The Chairman, vice-Chairman and Executive Director of Association are the members of the Interagency Coordinating Council for the development of the nanotechnology industry in the Republic of Belarus.

RANI aims to create of the conditions for the cooperation and integration between its members, foreign and domestic partners, by supporting and providing the training of employees of organizations-members of RANI and others in the relative field through the organizing and conducting trainings, workshops and courses for professionals, scientific conferences and other events.

4. Description of Dissemination and Exploitation Plan

During the early stages of Physics, consortium partners, led by the University of Cyprus, collaborated very closely to ensure that all dissemination and exploitation activities are undertaken throughout the duration of the project and are realized in a timely manner. The following list provides a synopsis of the dissemination and exploitation activities undertaken and plans for future dissemination and exploitation activities. The dissemination and exploitation activities are adapted based on the project's needs to achieve the highest possible impact both at the national and European level. To facilitate the organisation and focus of the planned activities, they have been classified into four broad categories, capturing all stages of raising awareness. These categories are:

- **Building awareness:** This is the first set of actions that should be undertaken in all dissemination efforts, in order to make sure the project objectives and expected outcomes are known to interested educational and industry stakeholders and to Belarusian society in general.
- **Building understanding:** Further to awareness, the next general objective is to create real understanding of what the project is aiming to achieve. Again, this category of actions addresses not only the primary group of stakeholders, but also a broader group of interested stakeholders.

- **Achieving engagement:** The stakeholders of the project are expected to be involved in the whole process beyond understanding its objectives. This calls for actual engagement of interested stakeholders in both the education and industry sectors, either by participating in the reformation of Belarusian higher educational system according to the Bologna practices or by guiding consortium partners in identifying and meeting specific needs in the labour market in the field of functional nanomaterials and photonics.
- **Maximising impact and sustainability:** The ultimate objective of any project is to maximise the final impact to the academic faculty, students, and academic communities and the Belarusian society in general. Therefore, throughout the duration of the project, activities should focus more on ensuring this impact and achieving sustainability of the results.

The following subsections analyse further the above categories of activities. The categorisation of the foreseen activities is not always clear in specific categories as many of them can be used to address more than one dimension of the dissemination and exploitation tasks. However, for simplicity, we list each activity only under one of the identified dimensions, usually the one in which the consortium believes the activity will impact more.

4.1. Building awareness

The following activities and tools have been categorised as main drivers for building awareness for the project objectives and expected outcomes:

4.1.1. Internet Presence

The internet presence of Physics is primarily realized through the project's website: <http://physics.rtu.lv/> It is the main dissemination tool that provides important information related to the project. Consequently, the website needs to follow the project's evolution and it is updated constantly with all newly available information and outcomes. Moreover, it will provide important background information on the project, objectives, accomplishments, news, and the partners' roles and description.

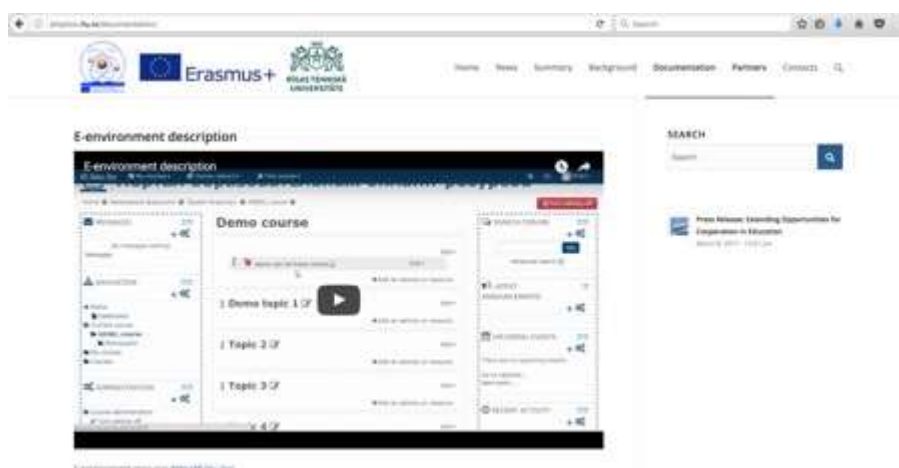
The website is developed, maintained and hosted by Riga Technical University. However, all consortium partners will be contributing to the content of the website during the implementation of the project. The screenshots below present a few of the public access pages of the Physics project website. The Physics publicly accessible website conveys general information about the project and enables visitors to understand its potential outcome. The following elements can be found on the website:

- General information about the Physics project;

- News about the progress of the project, including press releases, workshops, and student training sessions.;
- A summary of the Physics project;
- Important background information on the project;
- Important documentation on the project, such as a demo on the e-environment used in the project;
- Partner profiles and their contribution to the project;
- Contact information



<http://physics.rtu.lv/>



<http://physics.rtu.lv/documentation/>



<http://physics.rtu.lv/partners/>

The traffic on the project's website is monitored using widely-adopted tools, such as Google Analytics. Specifically, for the project's website, internal tools for measuring impact will be adopted. This will create a good awareness for the consortium and help further target interested stakeholders.

4.1.2. Social network presence

The consortium recognizes the importance of a strong social network presence and profile strategy. According to the decisions taken by the management committee, the Physics project will avoid creating too many social media accounts on the project level. However, all partners have expressed their commitment in actively contributing to the dissemination of the project through links to articles, press releases, and multiple other activities that will promote the project. A Facebook group and a LinkedIn group have been created to promote the project objectives, actions undertaken, and outcomes. Experience shows that separate projects' accounts on social media, fail to meet the necessary mass of attracted users, while if they are supported by institutions' accounts that have already established contact databases, the impact becomes greater. It is expected that the Physics project will achieve high penetration to the social media by taking advantage of the actual social network built around the partners, people involved in the project, as well as stakeholders and general public with interest in the project.



<https://www.facebook.com/groups/515719888598785/>

4.1.3. Promotional material

4.1.3.1. Project logo

The design of the Physics logo was undertaken by Riga Technical University. Following several consortium partner suggestions and an iterative selection process, the following was the winning design which will be used in all project dissemination and branding material. The logo is also shown at the end of this document.



4.1.3.2. Project leaflet

During the first year of the project, an introductory leaflet was designed, aimed at promoting the project objectives, the participating consortium organizations, and the beneficiaries of the expected outcomes.


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 СОВЕРШЕНСТВОВАНИЕ МАГИСТЕРСКОГО ОБРАЗОВАНИЯ В
 ОБЛАСТИ ФИЗИЧЕСКИХ НАУК В БЕЛОРУССКИХ УНИВЕРСИТЕТАХ
 IMPROVEMENT OF MASTER-LEVEL EDUCATION IN THE FIELD OF
 PHYSICAL SCIENCES IN BELORUSSIAN UNIVERSITIES


**BELARUSIAN
STATE
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Physics


**1862
RIGA TECHNICAL
UNIVERSITY**

Цели: модернизировать учебные планы в четырех университетах Беларуси в соответствии с Болонской практикой в физической науке в области электронных технологий; повысить качество и актуальность образования путем модернизации учебных программ, активного использования ИКТ, а также посредством сотрудничества для удовлетворения потребностей рынка труда.	Objectives: Upgrade education plans in four universities of Belarus in accordance with the Bologna practice of physical science in the field of electronic technology; improve the quality and relevance of education through education programs modernization, the active use of ICT, as well as through cooperation in order to meet labor market needs.
Главные задачи: Разработать современные учебные планы для магистрантов в области функциональных наноматериалов, фотоники и прикладной физики, учитывающие принципы Болонского процесса, и внедрить их в четырех белорусских университетах; Разработать и модернизировать курсы и учебные материалы для двух учебных планов магистерского уровня по специальностям «Функциональные наноматериалы» и «Фотоника»; Разработать среду обучения и преподавания на основе инновационных ИКТ; Привлечь высшие учебные заведения (вузы) Беларуси к принципам Болонской системы;	The main tasks: To develop modern educational plans for graduate/master students in the field of functional nanomaterials, photonics and applied physics, taking into account the principles of the Bologna process, and to implement them into four Belarusian universities; Develop and upgrade courses and training materials for two master's level educational plans in the fields "Functional Nanomaterials" and "Photonics"; Develop teaching and learning environment based on innovative ICT; Bring the Higher Education Institutions (HEIs) in Belarus for the principles of the Bologna system;


KU LEUVEN


**RIGA TECHNICAL
UNIVERSITY**


**University
of Cyprus**


**BELARUSIAN
STATE
UNIVERSITY**


**BELARUSIAN
STATE
TECHNOLOGICAL
UNIVERSITY**


**YANKA
KUPALA
GRODNO
STATE
UNIVERSITY**


**FRANCISK
SKORINA
GOMEL
STATE
UNIVERSITY**


**MINISTRY OF
EDUCATION OF
THE REPUBLIC
OF BELARUS**


NanoPlatform


LOTIS TII


**BELARUSIAN
PHYSICAL
SOCIETY**

info: physics.bsu.by/ru/departments/energy-physics/erasmus physics.rtu.lv
 dl.bsu.by => Физический факультет => Проект Erasmus +

4.1.3.3. Project posters

During the first year of the project, posters have been designed and displayed at the four participating Belarusian academic institutions, including Belarusian State University, Belarusian State Technological University, Francisk Skorina Gomel State University, and Yanka Kupala University of Grodno.

4.1.3.4. PR campaign

The consortium will undertake a series of PR email, Internet media and face-to-face campaigns promoting the project objectives and expected outcomes. Emphasis will be put on the need to address the importance of striving to reform the Belarusian higher education system according to the Bologna practices. This reform will change curricula from the existing system "5 plus 1" to "4+2" which should comply with the Bologna system principles in the area of physical sciences.

More specifically, for the media channels, the consortium will proceed in identifying key press channels (printed, online, TV and radio) at National and EU level.

4.2. Other dissemination activities

A second-level of planned activities are mainly targeting creating understanding about the content of the Physics project. Such activities are described below.

4.2.1. Announcements/Presentations at workshops, seminars and conferences

Conferences, workshops and other scientific and similar events are considered as one of the most effective dissemination tools. For this reason, consortium partners have agreed to participate in carefully chosen conferences and to organize local workshops to promote the project. For instance, a seminar will be organized for educational and other interested stakeholders in the Belarussian Ministry of education. Consortium partners will also present papers and posters at various conferences. The consortium will maintain and update the list of planned and attended conferences and other events and use a series of metrics to capture the impact of these events. For example, the location of the event, the number of attendees, the type of work presented, and other related information will be captured through the metrics.

4.2.2. Press releases

As has been already mentioned, during the lifetime of the project and when important milestones have been met, the consortium will prepare dedicated press releases to be disseminated to the press. The press releases will also be translated and disseminated in different languages. The first press release will be sent early at the beginning of the project for awareness purposes while the rest will follow as soon as the first set of results become available, such as the completion of students' training sessions.

4.2.3. Communication to other projects

The Physics consortium will set up communication channels and links to relevant EU and National projects.

4.2.4. Final conference

A final conference will be organized at the Belarusian State University in Minsk in order to disseminate the project and its outcomes. The aim is to reach a broad and diverse audience of individuals interested in the project and the field of applied physics in general in order to promote the actions undertaken during the Physics project, its outcomes, and propose new paths for promoting further the modernization of education in the field of applied physics in Belarusian universities. Further,

information will be disseminated regarding the evaluation of the impact transition from the traditional 5+1 system to the new 4+2 system on the labour market needs in applied physics.

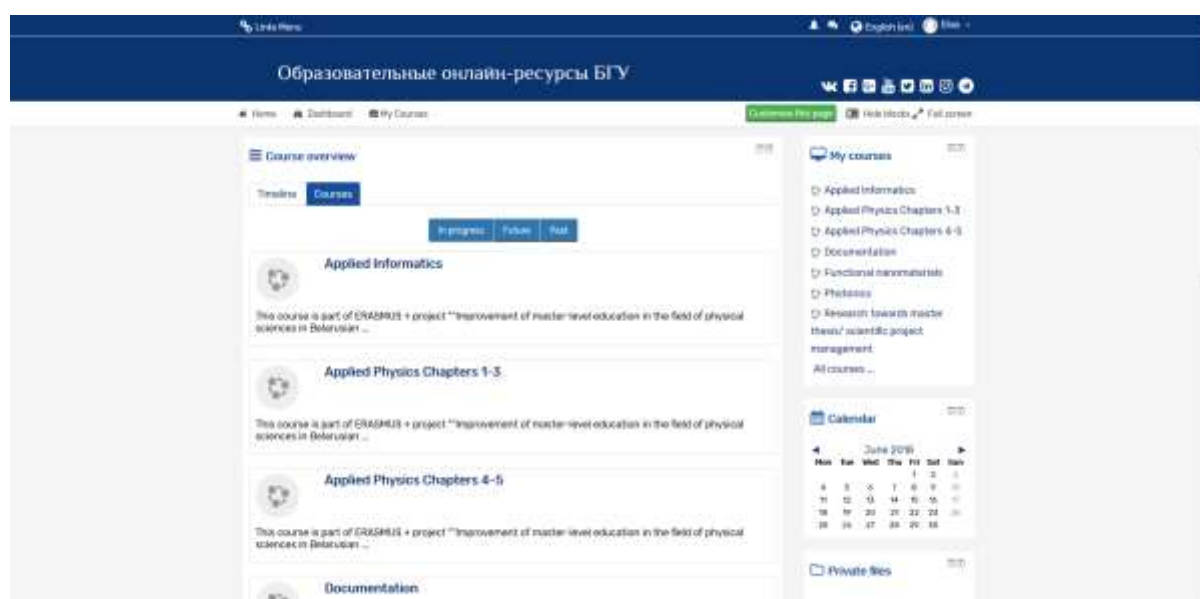
4.2.5. Publications

As the Physics project has broader educational and research perspectives, it is expected that the partners will perform dissemination and exploitation activities aimed towards the scientific community. Therefore, the consortium plans to prepare and submit articles for publications in high quality academic conference proceedings and journals.

In addition to presentations, the publications may also be accompanied by demonstration scenarios and other visual materials promoting the project.

4.3. E-environment

Part of the Physics project is the design and development of an e-environment, which will be an innovative ICT based teaching and learning environment. This e-environment can also be used as a dissemination tool, as well as a communication tool with the academic world and the different universities. The e-environment is hosted at <http://dl.bsu.by/> and a snapshot is shown below.



5. Achieving Engagement

While activities undertaken during the Physics project will benefit primarily the Belarusian higher education system, participating faculty members and students, the actual engagement will reach a wider audience in the Belarusian society and the EU community. A reformation of the Belarusian higher education system to adhere to the Bologna practices and the involvement of the industry, the educational system and the Belarusian Ministry of Education in this process will not only build awareness about the project but will also guide students in developing the required skill and knowledge to compete in a globally competitive labor market. For this reason, the identified groups of interested stakeholders will be students, faculty, and other educational and industry experts that will be reached to communicate the project's objectives and outcomes. Engagement will also be achieved by arranging face-to-face meetings with interested stakeholders, discussing and receiving feedback from them, introducing the newly developed modern master-level programs in the field of functional nanomaterials, photonics and applied physics, and updating courses and teaching materials in the field. The engagement of the Belarusian Association of Nanoindustry, the Belarusian Physical Society, the Ministry of Education and other associated partners will also be required to administer surveys, questionnaires, and field visits to other Belarusian higher education institutions and enterprises. To involve the labour market, consortium partners will undertake the following steps: (a) Devise two sets of questionnaires: a curriculum questionnaire and a questionnaire for the evaluation of courses and laboratory study programs. (b) Then a panel of experts who are also members of the Belarusian consortium will be interviewed. For example, experts from the Belarusian Physical Society (BPO) presidium and from the laboratories of the institute of the National Academy of Sciences of Belarus and the heads of the departments/laboratories of Belarusian universities will be interviewed. The experts will be invited to share their views on the transition of higher education in Belarus to the Bologna 4 + 2 system and the importance of introducing new courses and laboratory work to help students build new skills in this area. Consequently, the results of the project will engage further collaboration between HEIs, NGOs and business and promote the availability of a high-skilled workforce in the domain of physics (including functional nanomaterials, photonics, electrical engineering, electricity and magnetism, etc.).

5.1. Maximize impact and sustainability

The last but not least dimension of the dissemination and exploitation activities is the maximisation of the impact and sustainability of project results. It is therefore important to clearly identify all exploitable outcomes, such as the development of modern master-level programmes in the field of nanomaterials, photonics, and applied physics, the development and modernization of courses and

teaching materials and ICT-based teaching and learning activities, the preparation of students to compete in the labor market. Through this process, the reformation of the education system and the implications for the Belarusian educational system will be addressed and achieve a higher level of impact and sustainability for the project. Two model curricula, which will include Model standard educational systems for functional nanomaterials and photonics will also be developed. The programs will be approved by the Ministry of Education of Belarus at the beginning of the second year of the project. In the second year of the project, study programs, as well as sets of curricula subjects (special courses) for each of the universities will be developed on the basis of the approved Model (standard) educational programs. All these actions and initiatives will be promoted to maximize the impact and sustainability of the project. Compatible standard study programmes (including lecture courses, laboratory classes and appropriated didactic materials) by five directions will be developed in English. Study programs, with a courses description, will be issued as e-books. The overall objective of the exploitation strategy of the project will be that the consortium partners and the participating academic institutions collaboratively exploit the outcomes and reach out to both the education and industry sectors to ensure high impact and visibility of the project results.

6. Description of Partner Involvement in the Dissemination and Exploitation Activities

Consortium partners have a rich and diverse experience in delivering EU projects and in building effective dissemination and exploitation networks in order to reach interested education, industry and other related stakeholders. All consortium partners have already agreed to actively contribute in the process of disseminating and exploiting the project's objectives and outcomes. Consortium partners from all eight organizations will be involved in the multiple dissemination and exploitation activities that will be undertaken throughout the duration of the project. The University of Cyprus will lead consortium partners in ensuring that all dissemination and exploitation activities are delivered on time and have a high impact within the Belarusian and broader EU community. Some of the activities that consortium partners will undertake include:

- Press conferences, press releases, leaflets, posters, TV and radio, social media, project logo
- Project website design and development and regular updating portal by dissemination information
- Seminar for stakeholders in the Ministry of Education of Belarus
- Information sessions

- Final conference
- Double-sided agreements
- Preparation for 2nd year master programs testing beyond the project
- Conference papers and presentations

Table 1 below provides a detailed plan of all dissemination activities, each partner's involvement in the dissemination activities and due dates as they appear on the original proposal that was funded. The status of each dissemination activity is also indicated. All dissemination goals have been met; however, consortium partners are still striving to disseminate further the project through conference presentations and multiple other publications.

Item	Activity	Responsibility	Due Date	Status
M01 (WP5.1)	Press Conferences	University of Cyprus All Consortium Partners (RTU, KU Leuven, UKSUG, GSU, BSTU, BPS, RANI, MERB)	14.10.2018	✓
M01 (WP5.1)	Press Releases	University of Cyprus All Consortium Partners (RTU, KU Leuven, UKSUG, GSU, BSTU, BPS, RANI, MERB)	14.10.2018	✓
M01 (WP5.1)	Leaflets (Provided at Belarusian Universities such as Belarusian State University, Belarusian State Technical University, Francisk Skorina and Yanka Kupala Grodno State University)	Belarusian State University (BSU) Riga Technical University (RTU)	14.10.2018	✓
M01 (WP5.1)	Posters (Provided at 4 Belarusian Universities: Belarusian State University, Belarusian State Technical University, Francisk Skorina and Yanka	Belarusian State University (BSU) Riga Technical University (RTU)	14.10.2018	✓

	Kupala Grodno State University)			
M01 (WP5.1)	TV and Radio Interviews	All Partners (Yanka Kupala State University of Grodno – 4 TV and Interviews)	14.10.2018	✓
M01 (WP5.1)	Social Media	University of Cyprus (All Partners)	14.10.2018	✓
M01 (WP5.1)	Project Logo	Belarusian State University (BSU)	14.10.2018	✓
M01 (WP5.2)	Project Website	Belarusian State University (BSU)	14.10.2018	✓
M01 (WP5.3)	Seminar for Stakeholders in the Ministry of Education of Belarus			✓
M01 (WP5.4)	Information Sessions			✓
M01 (WP5.5)	Final Conference	Belarusian State University (BSU)	12.09.2018	✓
M01 (WP5.5)	Double-sided Agreements			✓
M01 (WP5.6)	Preparation of 2 nd year master			✓
M01 (WP5.7)	Conference Papers and Presentations	All Consortium Partners (RTU, KU Leuven, UCY, UKSUG, GSU, BSTU, BPS, RANI, MERB)	14.10.2018	✓

Table 1: A detailed plan of all dissemination activities

7. Conclusion

Active and well-planned dissemination contributes to the enrichment of global knowledge in the identified target domain, to raise awareness in the scientific community and to exploit potential synergies with related research projects. This document summarises the current and planned state of dissemination activities carried out as part of the Physics project. The Physics consortium has been active in all dissemination channels: conferences, workshops, and publications. Furthermore, a

considerable repository of dissemination material, including posters and press releases, was created and distributed.

The Internet presence of the project ranges from the Physics project's main website, which comprises a public means of communication and providing information to interested stakeholders, to the Facebook and LinkedIn groups.