

# Regional Academic Centers and Their Role for Digitalization of the Cultural and Historical Heritage of the Black Sea Region

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**Abstract.** Regional academic centers in the country create opportunities for applying an interdisciplinary approach in research, education and, above all, effective applied results serving business, municipal and national management organizations and institutions. One of the main activities of the Association "Regional Academic Center of Bulgarian Academy of Sciences" in Burgas is participation in the development of methods and technologies for digitalization of the cultural and historical heritage of the Black Sea region. The outsourced unit of the Institute of Mathematics and Informatics of the Bulgarian Academy of Sciences carries out digitization activities of the cultural and scientific heritage of the region, having so far participated in activities to create digital libraries for the iconic collection of the Burgas History Museum and for the collections of the Regional Library "Peyo Yavorov" Burgas.

**Keywords:** Regional Academic Center, Bulgarian Academy of Sciences, Digitalization, Cultural and Historical Heritage, Black Sea Region.

## 1 Introduction

The Bulgarian Academy of Sciences (BAS) carries out scientific activity in accordance with universal human values, national traditions and interests. The institution participates in the development of world science and helps to increase the spiritual and material values of our nation. The main goal of the National Academic Network (NAN) is to create conditions and prerequisites for full-fledged cooperation between the units of the BAS and higher schools, the academic community, industrial organizations and municipal authorities in the relevant regions and administrative areas in the Republic of Bulgaria. Regional Academic Centers (RAC) have been established in Plovdiv, Varna, Stara Zagora, Sliven, Burgas, Dobrich, Gabrovo, Shumen, Pleven, Veliko Tarnovo, Ruse, Blagoevgrad, Razgrad, Montana, Vratsa, Kazanlak, and Smolyan. The goal of the established RACs in the country is to establish themselves as environments that create opportunities for the application of an interdisciplinary approach in scientific research, education and, above all, efficient applied results serving business, municipal

and national management organizations and institutions. The main directions of the interaction and cooperation between the partners united on a voluntary basis in the RAC are defined in the memorandums and cooperation agreements concluded between them and the BAS Management. These documents reflect the region-specific interests and needs of the RAC partners, especially the municipalities, specific topics and objectives of cooperation, as well as the rights and obligations of the participants are indicated.

## **2 Exposition of the Investigation**

The Non-profit association for public benefit "Regional Academic Center of BAS" was established in Burgas on 11.06.2020 and is the legal successor of the first in our country Regional Academic Center of BAS in Burgas, established in 2010. The association was registered in the public register of non-profit legal entities maintained by the Registration Agency on 31.07.2020. The founders of the new research unit were the Bulgarian Academy of Sciences, represented by the chairman Academician Julian Revalski, member-cor. Ekaterina Bachvarova, director of the Institute for Climate, Atmosphere and Water Research at the Bulgarian Academy of Sciences, Prof. Dr. Desislava Paneva-Marinova from the Institute of Mathematics and Informatics of the Bulgarian Academy of Sciences (IMI-BAS), Prof. Dr. Atanas Palazov from the Institute in Oceanology of the Bulgarian Academy of Sciences, Prof. Dr. Ivaylo Dimitrov - Deputy Director of the Institute of Polymers at the Bulgarian Academy of Sciences, Prof. Dr. Boyka Mircheva - Director of the Kirilo-Methodievski Scientific Center at the Bulgarian Academy of Sciences, Prof. Dr. Magdalena Mitkova, Rector of "Prof. Dr. Asen Zlatarov University" - Burgas, Prof. Dr. Galya Hristozova from BSU, Dr. Milen Nikolov, Director of RIM - Burgas and Capt. Georges Dereliev, Chairman Chamber of Commerce and Industry. The activity developed by the Association is of public benefit in the direction of regional, national and transnational development, including with a focus on thematic areas according to strategic documents Innovation strategy for intelligent specialization and the main types of investments for the South-Eastern region.





**Fig. 1.** Establishment of the Association.

The priority areas for development of the Association are:

- science, innovation and modern technologies - creative and recreational industries; Digitization of cultural heritage;
- mobility and regional connectivity; investments in human resources;
- low-carbon economy, green investments, circular economy;
- integrated development of urban, rural and coastal areas;
- cross-border and transnational cooperation;
- tourism (ecological, health, cultural, etc.) and wellness;
- chemical products and technologies
- information and communication technologies, services and telecommunications;
- marine ecology, aquaculture and fish farming;
- biotechnologies, biofoods and bioproducts;
- mechatronics; energy technologies and biofuels;
- humanities and social sciences;
- medicine, public health and health care.

To achieve the set goals, the Association prepares and conducts research, surveys and analyzes related to scientific and socio-economic development, creates, coordinates, manages and monitors projects, programs, consults and supports other public and private organizations in connection with the preparation of analyses, scientific research, the preparation and implementation of projects. The main goals and activities of the Association "Regional Academic Center of BAS"-Burgas are:

- To assist in the development of expertise, opinions and other expert evaluations on projects of normative acts, regional, national and international strategies and projects and to initiate, develop and participate in scientific research and scientific-applied projects;
- To assist and develop regional forecasts and assessments of the state and qualities of the components of the environment, of biological diversity; monitoring of the environment and natural resources in the region, protection of

the population and critical infrastructure and risk management of natural disasters and accidents;

- To assist and participate in the development of technology centers, business incubators and technology parks for technology transfer and to participate in the development of methods and technologies for the separation and processing of polymer pollutants from the marine environment;
- To develop and implement information and communication technologies with a view to the application of computer systems, networks and platforms for the creative and recreational industries;
- To assist in the development and implementation of microcomputer control of technological processes;
- To stimulate educational and qualification programs, to direct the flows of knowledge and improve the synergy between scientific research and its applications;
- To participate in the development of programs and projects related to socio-economic development, education, environmental protection and sustainable use of natural resources on the territory of the municipality of Burgas and the South-East region;
- To promote the involvement of the academic and educational environments in solving the social problems of the society;
- Development and implementation of national and international strategies in the field of science and education, building and maintaining databases for the scientific and academic communities in the Burgas region;
- Organization of multifaceted activities to build capacity at the local level with skills for planning and implementation of integrated projects through: research, analysis, training, consultation and expert assistance, as well as organization and participation in forums and events related to the implementation of policies with a focus on priority areas;
- Building partnerships between public and scientific organizations, government institutions, media, local communities and businesses to conduct good practices and transfer innovative ideas for smart and climate neutral development of the target territory.

The modern life in recent decades has led to a wide spread of digital methods, and therefore one of the main activities of the RAC is to participate in the development of methods and technologies for digitization of the cultural and historical heritage of the Black Sea region. Currently, the RAC is working on two winning projects related to the provision of digital services in the field of medical and rehabilitation sciences. The first of them includes the project "Development of digital skills for online rehabilitation therapies (e-KINE)", 2020-1-RO01-KA226-VET-095462, under the Erasmus+ program with a total budget of 59,877 euros. The e-KINE project aims to offer a solution to replace classic rehabilitation services with online services, in particular by building readiness for digital education, developing digital competences and strong cooperation between the world of education, digital technology providers and the world of labor. The project should complement efforts to help the medical sector recover from the crisis in terms of innovative online solutions. The overall objective is to promote innovative

methods and tools for teaching, learning and work-based learning as drivers of improvements in lifelong learning and to support kinesitherapists/physiotherapists in acquiring the skills to provide online medical services needed in the context of COVID-19 pandemic. e-KINE's innovative learning approaches include:

- Development of the e-KINE online collaboration platform as a virtual place where learners and trainers can learn, teach and co-create course content. Promoting digital learning in the field of medicine and maintaining electronic content in different languages are one of the main goals and priorities. The innovations consist in the creation of an interactive learning model and new methodologies for acquiring knowledge in the field of rehabilitation and kinesitherapy.
- The e-KINE course is included in the e-learning platform. The training content is based on a curriculum that gives the trainees advanced knowledge on the use of various online telemedicine tools. Special emphasis is devoted to online rehabilitation tools, including real-life cases. A database of rehabilitation protocols for various pathologies has been developed.
- The pilot approach is oriented towards learning through practice, and the aim is to enable learners to apply the acquired knowledge in practical workplace situations and to function as an online rehabilitation unit in a virtual medical environment. Under the supervision of the trainer, the intern communicates and works with the patient, assesses his condition and selects the appropriate rehabilitation protocol, adapting it to the patient's needs and monitoring the process. The idea and results of the project will be useful for the academic community in the Burgas region and we will be happy to spread them among our members.

The second project "Development of New Skills for Medical Students in Pandemic Context" (e-MED-skills), 2022-1-RO01-KA220-HED 000085385 is again led by Assoc. Prof. Dr. Yanislav Zhelev from IMI-BAS and Regional academic center of BAS – Burgas. The mission of the e-MED-skills project is to offer an e-course delivered by a telemedicine platform that is focused on symptoms, complications, treatment and recovery after COVID-19. This will help medical students in their final years of study to acquire new skills as required by the labor market in the context of the current pandemic. In this way, we are contributing to help the medical sector recover from the crisis by implementing innovative digital solutions in line with the EU's strategic priorities.

The Association annually co-organizes and hosts the international conference "Digital Presentation and Preservation of Cultural and Scientific Heritage" - DiPP, together with the leading role of the Institute of Mathematics and Informatics of the Bulgarian Academy of Sciences, under the patronage of UNESCO and the Municipality of Burgas. The event is supported by the National Fund "Scientific Research", Regional Historical Museum – Burgas and Burgas Free University. The international conference "Digital Presentation and Preservation of Cultural and Scientific Heritage" is traditionally held in September in Burgas and brings together scientific centers working in the country and abroad to present the latest achievements in the field of ICT for cultural and scientific heritage as well as to identify guidelines for future research. More than

400 scientists from more than 25 countries (Bulgaria, Germany, Greece, Israel, Italy, China, Latvia, Portugal, Romania, Russia, USA, Serbia, Hungary, Ukraine, France, Netherlands Czech Republic, Switzerland, *etc.*) have participated in the annual editions of DiPP, who present scientific and project reports published in the conference proceedings. The conference aims to present innovations, projects and scientific and scientific-applied developments in the field of digital documentation, archiving, presentation and preservation of world and national tangible and intangible cultural and scientific heritage. The main focus is providing open access to digitalized national cultural and scientific heritage and following sustainable policies for its continued digital preservation and preservation. The priority is the digital presentation and preservation of monuments of culture and history in conditions of risk, including those from the Burgas region. The forum showcase innovative technologies and prototypes, including digital archives, virtual museums and digital libraries, which are the result of established practices and achievements in the field. The representatives of public and specialized libraries, museums, galleries, archives, centers, both national and foreign research institutions and universities participated and exchanged experiences, ideas, knowledge and best practices in this field. During the forums, seminars organized by the IMI-BAS, with the theme "Open access to scientific publications and data - Bulgarian open scientific cloud" are held, which mainly focuses on the following activities:

- indicators of open access;
- best practices of partners of partners;
- discussion of problems with scientific research in the field;
- discussion of the possibilities of creating a network of open access registers;
- contribution to the problems of harmonization of national legislation and practices;
- discuss the possibilities for developing training courses for creators and managers of scientific digital registers,
- ensuring interoperability.

The seminar "Virtual museums and their educational applications", organized by the IMI-BAS within the framework of the National Scientific Program "Cultural-Historical Heritage, National Memory and Social Development" (KINNPOR, n.d.), also aroused interest. Also of interest is the seminar on serious games and their educational applications, organized within the framework of the National Research Program for Cultural Heritage, a national program for research and social development, approved by DCM No. 577 of August 17, 2018, where representatives of universities, and research institutions participate and exchange experience and best practices in the field of digital transformations. The educational game "The Thracians" (The Thracians Game, n.d.) presents a three-dimensional reconstruction of the uncovered building under Ostrusha mound in the Valley of the Thracian Kings near the city of Kazanlak.

New possibilities for digitization of the newest cultural and historical site on the territory of Burgas Municipality, *Aquae Calidae* (Zlatkov, Paneva-Marinova, Luchev, Pavlova, & Pavlov, 2019) (Paneva-Marinova D., Goynov, Pavlova, Luchev, & Pavlov, 2021), was the subject of discussion at the seminar "*Aquae Calidae* in Digital World" in Burgas, June 8-11, 2022. The scientists and museum workers conducted a joint initiative with colleagues from IMI-BAS under the leadership of Prof. Dr. Desislava

Paneva-Marinova. The Regional Academic Center is a co-organizer and host of the Digital Burgas on July 7, 2022 in the International Congress Center. The conference aims to increase public awareness of the application of innovation and technology in the life of a smart city.

Academician Revalski highly evaluated the activities of the outsourced unit of the Institute of Mathematics and Informatics of BAS - section of mathematical and computational linguistics, in which the scientists Assoc. Prof. Dr. Yanislav Zhelev, Assoc. Prof. Dr. Maria Monova-Zheleva, and Assoc. Prof. Dr. Evgenia Nikolova work in good cooperation with the Municipality of Burgas. "The local government's attitude towards the exact sciences led to the construction three years ago of a completely new school in this area - the Professional High School for Computer Programming and Innovation in Burgas, and the Regional Center of the BAS is actually one of the most active in the country." said the chairman of the BAS academician Julian Revalski. The outsourced unit carries out digitization activities of the cultural and scientific heritage of the region, having so far participated in the two activities: Creation of a digital library for the iconic collection of the Burgas Historical Museum (Paneva-Marinova D. , Goynov, Luchev, & Zlatkov, 2021) and Creation of a digital library for the collections of the Peyo Yavorov Regional Library (DL "Peyo Yavorov" - Burgas, 2023).





**Fig. 2.** Working moments from international and national conferences.

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