

STATEMENT

of Assoc. Prof. Assen Ivanov Asenov, PhD

from the Department of Landscape Ecology and Environmental Protection of the Faculty of Geology and Geography at Sofia University "St. Kliment Ohridski",

Member of the jury,

according to an Order of the Director of the Institute for Space Research and Technology at BAS, № 16 / 24.01.2020, pursuant to Art. 4 para. 2 of the Law on the Development of the Academic Staff in the Republic of Bulgaria and according to a decision of the Scientific Council of ISRT - BAS (Minutes No 8 of 23.01.2020)

Subject: Competition for the occupation of the academic position of associate professor in higher education field **4. Natural sciences, mathematics and informatics**; professional direction **4.4. Earth Sciences**, specialty "Earth and Planet Remote Sensing", for the needs of the "Remote Sensing and GIS" section, published in SG, issue 98 of December 13, 2019.

Within the term stipulated by the Law on the Development of the Academic Staff in the Republic of Bulgaria, competition documents were submitted by one candidate - Chief Assistant Professor Alexander Gikov, PhD. The documents and scientific production presented by him are admitted for participation in the competition and meet the requirements of the law. The first meeting of the jury was held on 14.02.2020, when a chairman and reviewers were elected in accordance with the regulations. I have no comment on the procedure.

1. Professional experience: Chief Assistant Professor Alexander Gikov (born 17/09/1970) has completed his higher education in 1995 in two departments of the Faculty of Geology and Geography at Sofia University "St. Kliment Ohridski": Department of Landscapes and Environmental Protection and Geomorphology and Cartography Department. He obtained a PhD degree in the scientific specialty 01.04.12 (Earth and Planet Remote Sensing) at the Institute of Space Research and Technology at BAS in 2019, defending a thesis on "Mapping and Analysis of Contemporary Landscapes in the Rila Mountains by GIS and Remote Methods". From 2000 to 2020, Dr. Alexander Gikov has held successively the following positions: Specialist, Research Associate III, Research Associate II, Research Associate I at the Institute of Space Research at BAS and Chief Assistant Professor at the Institute for Space Research and Technology at BAS.

Dr. Gikov has a very good scientific qualification in the field of physical geography and extensive experience in the application of geo-information technologies in environmental studies. He also demonstrates excellent practical skills in using geographic information systems and specialized aerospace data processing software.

2. Scientific Outputs: The publications submitted for review are 34 in number. In two of the 10 peer-reviewed scientific papers, referenced in world databases, Dr. Gikov is the lead author, one publication is individual, in two publications he is the second, and in four - the third author. It should be noted that the application of geo-information technologies is related to the collective skills of scientists from different fields and it is logical that collective works prevail.

Among the remaining 24 publications of Chief Assistant Professor A. Gikov in 7 of them he is a single author, in 11 publications he is the first author, in 4 publications he is a second author, one time he is a third author and there is also a collective publication of eight authors, in which he is the sixth in a row. According to the attached reference information for the compliance with the minimum national requirements under Art. 2b, para. 2 and 3, respectively, of the requirements of Art. 2b, para. 5 of the Law on the Development of the Academic Staff in the Republic of Bulgaria and in accordance with the Rules of the BAS for the conditions and procedure for acquiring scientific degrees and for occupying academic positions in scientific field 4. Natural sciences, mathematics and informatics, the candidate for the academic position "Associate Professor" covers and exceeds the required standards.

The studies carried out by the applicant, aimed at developing and refining the methodology for natural environment studies through the application of geo-information technologies and landscape methods, have a positive contribution character. The applicant has grouped his contributions in a more general way, which I believe should be more detailed. The methodology for improving environmental studies must first be highlighted by climate change through the creation of an original methodology for modeling the spatial distribution of climatic elements. Here, new geo-information technologies are combined with the regression analysis traditionally applied in climatology, which eliminates the need for a large number of climate stations used in the interpolation and mapping of the studied climatic element. The works with the numbers B4_1, B4_2; D8_1; D8_4 are applied in this direction. The geo-information technological imperative of these studies also includes biodiversity, with the assumption that there will be no competition for the Bosnian pine - *Pinus heldreichii* **H. Crist.**, with other tree species towards the upper border of the forest during the hypsometric shift of the plant belts in height, which means that

the Bosnian pine will be the winner in climate change process. To this contributing emphasis of research must be added the extensive pollen study of different species of beech *Fagus spp.*, conducted from the Baltic to the Black Sea (B4_3), the results of which are useful for the interpretation of fossil pollen diagrams and the abundance of beech trees in the vegetation. This is especially important when studying Holocene beech expansion in Europe for different climatic regions. Despite the not very clear synchronization, the study results shed some light on beech reproductive strategies.

Another contributing thematic element related to geo-information technology and climate change involves the use of landscape methods. Applied scientific papers with numbers: B4_4, B4_8, D8_2, D8_3, D8_6, D8_7, D8_9, D8_24 can be considered in this direction. The mapping and inventorying of the rock glaciers in the high mountains in Bulgaria was carried out using remote methods. A significant number of moraines were mapped and dated in the Rila Mountains, which proved their absolute age - G8_16, D8_22.

The second large group of contributions in the works of Chief Assistant Professor Gikov includes the application of geo-information technologies for the study of risky natural phenomena and processes, such as risk management in the municipality of Lom (B4_5); an original methodology for spatial modeling of the magnitude and extent of landslide processes has been independently developed (B4_6, D8_15, D8_17, D8_18, D8_19, D8_20, D8_21); a geological hazard assessment was carried out at the tectonically active zone in the northern foot of the Rila and Rhodope Mountains (G-8_8); with the help of geo-information technologies the damage from forest fires and spruce have been mapped and evaluated: G8_5, D8_11, D8_12, D8_13, D8_14, and D8_23.

The third group of contributions in the works of Chief Assistant Professor Gikov involves the application of geo-information technologies in landscape-environmental studies. Carbon storage has been mapped in part of the Central Balkan Mountains (B4_7). A sub-pixel classification of the types of agricultural crops in Bulgaria was made and accurate maps were created in different agricultural regions (B4_9, B4_10); contribution to landscape-geochemical studies is the use of GIS methods to construct the lattice layers of the background content of heavy metals in the Mesta River basin (G8_6); the methodology for mapping the degree of anthropogenesis of landscapes has been refined (G8_9); the applicant participates in the creation of a conceptual model of a scientific information complex with thematically distributed satellite and sub-satellite databases for aerospace test sites (D8_10); he participates in the application of aerospace data for landscape-environmental monitoring in agriculture (D8_24).


3. Scientific and applied results: For the period 1998-2020 the applicant participated in 23 (twenty-three) scientific projects: 3 (three) - to UNDP, 9 (nine) - international, 7 (seven) - to the Ministry of Education and Science, 2 (two) to the Operational Program "Environment", one project in the field of precision agriculture and one project under Directive 92/43 EEC and Directive 2009/147 EEC.

Reflection of the scientific achievements of Chief Assistant Professor Alexander Gikov in the scientific literature: Dr. Gikov has provided a personally elaborated bibliographical reference for his identified citations in the scientific literature, amounting to 134 (one hundred thirty-four), of which 11 (eleven) citations are in publications, referenced in world databases.

4. Critical notes and recommendations: The synthesized analysis of the scientific production presented by Chief Assistant Professor Alexander Gikov demonstrates the indisputable fulfillment of the requirements for occupation of the academic position of Associate Professor. Critical notes about his scholarly work are difficult to find, but I recommend his participation in monographs and textbooks that serve as attributive representativeness for the habilitated researcher.

5. Conclusion: The teaching, research and applied activities of Chief Assistant Professor Alexander Gikov meets all the requirements for occupation of the academic position "Associate Professor", specified in the Law on the Development of Academic Staff in the Republic of Bulgaria and the Rules of its application. I support his election as an "Associate Professor" in the professional field 4.4. Earth Sciences, specialty "Earth and Planet Remote Sensing", for the needs of the "Remote Sensing and GIS" section, in the competition announced in SG, issue 98 of December 13, 2019.

April 9th, 2020
Sofia

Signature: 
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