OPINION

by Assoc. Prof. Dr. Petar Petrov Nozharov,
Division "Physical Geography", Department of Geography, National Institute of Geophysics, Geodesy and Geography, Bulgarian Academy of Sciences,

member of the scientific jury of a competition for the academic position of Associate Professor in scientific field 4. Natural sciences, mathematics and informatics, professional field 4.4. Earth Sciences, academic discipline "Earth and Planets Remote Sensing", announced in State Gazette no. 98/13.12.2019

1. Competition details

The competition for the academic position of associate professor in scientific field 4. Natural sciences, mathematics and informatics, professional field 4.4. Earth Sciences, academic discipline "Earth and Planets Remote Sensing" has been announced in State Gazette no. 98/13.12.2019. This opinion was prepared on the basis of Order №16/24.01.2020 and the decision of the meeting of the scientific jury, Minutes №1/14.02.2020. Documents for the competition have been submitted by one applicant – chief assistant professor Alexander Gikov. The review of the submitted documents under the procedure showed that all the requirements of the Development of Academic Staff in the Republic of Bulgaria Act (DASRBA), as well as the regulations for its implementation, are met.

2. Details of the applicant

Alexander Georgiev Gikov was born on September 17, 1970. In 1995 he graduated from Sofia University "St. Kl. Ohridski" with Master's degree in "Landscape Science and Environmental Conservation" and 'Geomorphology and Cartography". Since May 1, 2000 he has been working at the Space Research and Technology Institute, Bulgarian Academy of Sciences. Initially, he was employed as a specialist, and since 2003 he has sequentially held the positions of research associate III, II and I degree. After the change of the law from 2011 until now he is chief assistant professor. In 2019, he received his Ph.D. degree in the field of Earth and Planets Remote Sensing, which corresponds to the academic discipline of this competition. The applicant is fluent in English and Russian. He also has practical experience in using Geographic Information Systems and specialized aerospace data processing software.

3. Analysis and evaluation of the submitted scientific papers and scientific contributions of the applicant

The applicant has submitted a total of 34 scientific publications for participation in this competition, which are not the same as those submitted for receiving a Ph.D. degree. 10 of them are included in the group of indicators C in accordance with the regulations for the implementation of the DASRBA, which covers the required minimum number and points for this indicator. All of these publications are in English, in one of which he is the only author and in one more he is the leading author. The other 24 publications are in the group of indicators D, thus also covering the minimum of points required for this indicator. 6 of these publications are in English and the rest are in Bulgarian. In 7 of them he is the only author and in 12 he is the leading author. Quantitatively, the scientific output is sufficient for the academic position of associate professor.

Applicant's scientific contributions are in three main areas, the first of which is of particular importance - development and refinement of the methodology for study of the natural environment through application of geoinformation technologies and landscape methods. In this first basic area, the applicant's scientific contributions can be grouped into several sub-areas. The first one is creation of a methodology for modeling the spatial distribution of climate elements, which combines new geoinformation technologies and regression analysis traditionally used in climatology. These contributions are developed in publications D8_1 and D8_4. The methodology is good in terms of the use of surface climatic data and for severely rugged terrain such as mountainous areas. However, these publications are relatively old and, in recent years, the measurement of climatic elements through satellite-mounted instruments has become increasingly important, and the resolution of these measurements has been increasing, including mountainous areas. This data source should now also be included in this type of methodologies. The second sub-area of scientific contributions relates to the design and construction of a geo-database with estimated distributions of five chemical elements as continuous statistical surfaces in order to be used as a reference basis for a comparative assessment of the technogenic transformation of landscapes. This contribution is developed in publication D8_6. A database for only one territorial unit has been created. The third sub-area of contributions relates to the development of a methodology for large-scale mapping of landscapes through aerospace images. There are more publications here - C4_7, D8_2, D8_3, D8_7, D8_9 - in which more aspects of this topic are addressed and studied. The more publications allow both a development of some theoretical additions to the methodology and their application in different regions of Bulgaria. The fourth sub-area of scientific contributions is related to the mapping and inventory of rock glaciers in the high mountains of Bulgaria by using remote methods, describing and measuring a number of small

glacial and firn bodies in Bulgaria and the Balkan Peninsula, and performing mapping and dating of a considerable number of moraine in the Rila Mountain, estimating their absolute age. These contributions are developed in publications C4_1, C4_2, C4_4, C4_8, D8_16 and D8_22. I believe that the most serious scientific contributions of the applicant are in this sub-area, which is also evidenced by the fact that many of the publications are in reputable international scientific journals with an impact factor. The citation of these publications is also high.

The second area of scientific contributions is related to the application of geoinformation technologies for the study of risk natural phenomena and processes. A methodology for spatial modeling of the magnitude and extent of the landslide process has been developed using time-lapse images and a network of vectors depicting horizontal displacements (C4_6). Using geoinformation technologies, mapping and damage assessment of forest fires and tornadoes were performed, and dynamics of landslides was monitored (D8_5, D8_11, D8_12, D8_13, D8_14, D8_15, D8_17, D8_18, D8_19, D8_20 D8_23). Geological and climatic risk as well as vulnerability in specific territories in Bulgaria have been evaluated (C4_5, D8_8).

The third area of scientific contributions of the applicant is related to the application of remote methods for mapping agricultural crops. A methodology for checking and validating agricultural crop types including geoinformation technologies and mobile application has been developed. By using it in combination with various methods for automatic classification of multi-temporal satellite images, a mapping of agricultural crop types was carried out, both of the entire country (C4_9) and of two agricultural regions in Northern and Southern Bulgaria (C4_10). The publications D8_10 and D8_24, which are included in this area of scientific contributions, only remotely and very generally investigate the subject.

4. Conclusion

The applicant, Dr. Alexander Gikov, has a serious scientific output that includes fields of research directly related to the academic discipline in which the competition is announced, as well as broader-scope studies covering various subjects related to earth sciences. The contributions are serious and prove that the applicant is a scientist recognized nationally and internationally. The scientometric indicators (583.3 points in total) cover and even significantly exceed the minimum required for the position of associate professor at the Bulgarian Academy of Sciences, which is 430 points.

Considering the above and the fact that the applicant meets all laws and by-laws requirements for the respective academic position, I give my positive assessment and recommend that the members of the scientific jury vote **in favor** of chief assistant professor

Alexander Gikov to take the academic position of associate professor in scientific field 4. Natural sciences, mathematics and informatics, professional field 4.4. Earth Sciences, academic discipline "Earth and Planets Remote Sensing" at the "Remote Sensing and GIS" division, Space Research and Technology Institute, Bulgarian Academy of Sciences.

Sofia, 07.04.2020 Author of the opinion: /п/

/Assoc. Prof. Dr. Petar Nozharov/

ВЯРНО С ОРИГИНАЛА

БЪЛГАРСКА АКАДЕМИЯ НА НАУКИТЕ
ИНСТИТУТ ЗА КОСМИЧЕСКИ ИЗСЛЕДВАНИЯ И ТЕХНОЛОГИИ