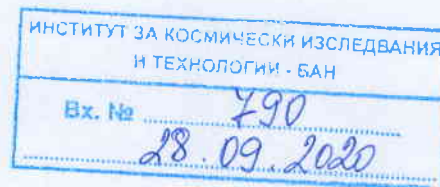


# R E V I E W



by

**Prof.Dr. Georgi Jelev from**  
Space Research and Technology Institute – BAS,

Member of a Scientific jury, according to order No 87/10.07.2020 of the Director of SRTI-BAS, under a competition for academic positions "Associate Professor", announced in SG No 56 / 23.06.2020 from the Space Research and Technology Institute – BAS in the field of higher education 4. Natural sciences, mathematics and informatics, professional field 4.4. Earth sciences; Scientific specialty "Remote sensing of Earth and planets" for the needs of the Department "Remote sensing systems".

## 1. General criteria for participation in the competition.

In the announced competition, **Chief Assist. Hristo Stoyanov Nikolov, PhD** from the Department "Remote sensing systems" at SRTI-BAS has submitted documents. He's the only candidate. The documents submitted by him meet the requirements for the academic position "Associate Professor" and are in accordance with the Law on the Development of Academic Staff in the Republic of Bulgaria (LDASRB), the Rules of Implementation of the LDASRB, the Rules of on the Terms and Conditions for Acquisition and Occupation of academic positions in the Bulgarian Academy of Sciences and the Regulations for Application of the LDASRB of the Space Research and Technology Institute – BAS.

The applicant meets the Minimum National Requirements under Art. 2b, para. 2 and 3, respectively, of the requirements of art. 2b, para. 5 of LDASRB and in accordance with the Rules of the BAS for the conditions and procedure for acquiring scientific degrees and for occupying academic positions in the field of higher education 4 - Natural sciences, mathematics and informatics, professional field 4.4. Earth Sciences.

The documents submitted by the applicant are a Request, a CV, a Diploma and an author's thesis on the acquisition of the Educational and Scientific Degree "Doctor" (group of indicators A), 34 pcs. scientific publications divided respectively 10 pcs. in Group B and 24 in Group D.

The number of points achieved by the candidate is greater than the number required by the Law and the Regulations attached to it.

Group of indicators	Required Points for Associate Professor under the LDASRB	Required Points for Associate Professor under the Rules of LDASRB of the Bulgarian Academy of Sciences and SRTI-BAS	Completed points from Chief Assist. Hristo Stoyanov Nikolov, PhD
A	50	50	50
V	100	100	254
G	200	220	230.57
D	50	60	64

## 2. Short bibliographical data

## **2. Short bibliographical data**

Chief Assistant Hristo Stoyanov Nikolov, PhD, was born on March, 19, 1966. In the period 1984-1990 he graduated from University of Mining and Geology "St. Ivan Rilski", Department of Automation of Mining Production.

In the scientific field he has been working for almost 30 years, of which 21 years in the Solar-Terrestrial Influences Lab.-BAS and 9 years at SRTI-BAS, and since 2003 he has been in academic position "Chief Assistant".

His professional skills are related to the application of remote methods and systems for processing multi-channel spectral data from different apparatus complexes for research of the natural environment and are presented in over 150 publications. He has acquired his professional competence through participation as an expert in 29 projects, five of which he is a manager.

24 pcs. his publications have been cited a total of 68 times (in Scopus and Web of Science, its h index is 2 and in Google scholar - 5).

The candidate speaks Russian, English and Spanish to varying degrees.

## **3. General characteristics of the applicant's research and applied science activities**

To occupy the academic position of "Associate Professor" in BAS there are higher requirements than those set out in the minimum national requirements.

### **1) Scientific research activity**

The list of scientific papers of a candidate on the issues of the competition is 34 pcs. out of a total of 64 pcs. They do not include the scientific papers used in the acquisition of the Doctor's degree thesis - 4 pcs.

#### **Indicator Group A**

This group includes a dissertation defended on December 17, 2018 for the award of educational and scientific degree "Doctor" on the topic: "*Application of nonlinear methods of image recognition theory in remote sensing of the Earth*" with scientific consultants: Assoc. Dr. Doino Ivanov Petkov and Prof. Dr. Boycho Velikov Boychev.

This group achieved 50 points and met the criteria.

#### **Indicator Group V**

This group of indicators includes 10 scientific publications in five leading specialized publications, which are *referenced and indexed in worldwide databases of scientific information* (Web of Science and Scopus). Of these, 3 pcs. fall into category Q1 with impact factor IF 2.177. The total number of co-authors is over 10. There is one independent publication and in 3 publications he is the first author.

In this group, 254 points were achieved and the criteria were met by 154 points.

#### **Indicator Group G**

In this group of indicators are presented 30 publications. In Group G point 7 (Scientific publication which are referenced and indexed in worldwide databases of scientific information) 6 pieces are presented. The remaining 24 publications fall under Group G point 8 (Scientific

publications in unreferenced journals with scientific review or in edited collective volumes), where the total number of points is 195.25. The total number of co-authors is over 30, personal publications – 2 pcs., first author is 7 pcs.

A total of 230.57 points were achieved in this group and covered the criteria by 10.57 points.

#### **Indicator Group D**

In this group of indicators includes the citations of 13 scientific publications. They are allocated accordingly:

in Group D, point 10. Citations or reviews in scientific publications referenced and indexed in worldwide databases of scientific information or in monographs and collective volumes – 4 publications quoted a total of 6 times.

in Group D, point 12. Citations or reviews in unreferenced journals with scientific review – the remaining 9 publications quoted a total of 23 times.

In this group, 64 points were achieved and the criteria were met by 4 points.

#### **2) Scientific and applied activities**

The applicant was an expert in 29 projects, for five of which he was a leader.

#### **3) Scientific and scientific and applied contributions of the applicant**

The scientific and scientific-applied contributions of the candidate, grouped in the following three scientific directions, are clearly visible from the presented publication activity:

1). *Development and implementation of innovative mathematical methods for thematic processing of multi-channel spectral data from different apparatus complexes for Remote Sensing.*

This highlights the main scientific interest of the applicant. It is associated with a continuation of the scientific work of his dissertation, in the application of methods and image recognition in earth observation.

The contributions are related with implementing a module for preliminary and thematic processing of multi-channel spectral images and combinations thereof in a hardware parallel environment. It allows the use of nonlinear mathematical methods (training of models with neural networks, models based on support vectors, etc.) to increase the accuracy in the classification of basic classes of objects from the studied areas of the earth's surface. These contributions are presented in 14 publications.

More than a third of the candidate's publishing activity presented in the competition is focused in this direction.

Publications: V4.1, V4.2, V4.3, V4.7, G7.1, G7.2, G8.1, G8.2, G8.3, G8.4, G8.5, G8.7, G8.19, G8.20

His contributions have been published in 6 journals, which are indexed in world-renowned databases of scientific information and in two publications unreferenced journals. The

promotion of his work is presented by 6 published reports delivered at national and international conferences. The candidate's personal contribution is evident in the many of publications, almost half of which he is the first or only author.

*2). Construction of field laboratory complexes for conducting in-situ and remote research as part of synchronous and quasi-synchronous experiments to obtain data in Earth observations.*

The contributions are related to the completeness and implementation of a mobile field complex for contact and remote measurement of environmental parameters. The main measuring instruments in the complex provide compatibility of aero- and satellite spectrometric equipment complexes, remote access to the registered data from the field measuring network and integration of data from different sensor systems.

The results of the research in this direction are presented through 5 articles and published reports, delivered in 7 national and international conferences.

Publications: V4.4, V4.6, G7.3, G7.4, G7.5, G7.6, G8.8, G8.10, G8.12, G8.13, G8.24

*3). Use of multi-channel spectral data from remote sensing studies to assess the hazard processes on the environment of natural and technological origin.*

The contributions in this direction are related to the use of passive and active remote sensing methods in solving specific applied tasks: processing and improving the accuracy in the classification of multichannel spectral data of objects of type "mixed class", assessment of the current state of soils in risk areas, assessment of soil moisture, differentiation of individual types of rock objects, deformations of the earth's crust as a result of man-made activities and others.

Due to the nature and specificity and the local nature of the tasks to be solved, the publishing activity is oriented towards reports at national and international conferences and journals with thematic focus.

For this group of scientific contributions the candidate has presented 3 publications in journals which are referenced and indexed in world-renowned databases of scientific information. Of these, he is the first author of one publication. The candidate has also presented eight published reports from international scientific forums and 2 publications in journals that are in unreferenced journals with scientific review.

Publications: V4.5, V4.8, V4.9, G8.6, G8.9, G8.11, G8.14, G8.15, G8.16, G8.17, G8.18, G8.21, G8.23

### **Conclusion**

The contributions in the three scientific directions are related to the application of knowledge and skills of the candidate in conducting scientific and applied tasks in the field of remote sensing of the Earth. They are related to collecting and processing of different types of in-situ and remote sensing data during experiments and observations on hazardous processes in the environment.

The documents and materials submitted by **Dr. Hristo Stoyanov Nikolov, Ph.D.** meet the requirements of the Law on Development of Academic Staff in the Republic of Bulgaria (LDASRB),

the Implementing Regulations of the Bulgarian Academy of Sciences, the Rules of Application of the Bulgarian Academy of Sciences and the Rules of the SRTI-BAS.

Chief Assist. H. Nikolov, PhD presented in the competition a sufficient number of scientific papers, other than the materials used in the defense of scientific degree "Doctor". On the main indicators he collects points exceeding the minimum required according to the criteria of SRTI-BAS. As a result, I confirm that the results he has achieved in his research fully meet the requirements for the academic position of "Associate Professor".

Chief Assist. H. Nikolov, PhD has original scientific and scientific-applied contributions, many of which are published in reputable scientific journals with impact factor and are promoted with reports in international forums. In many of his publications he has a leading role and is recognizable in the scientific community.

**This gives me reason to give my positive assessment of the candidacy of Chief Assist. Hristo Nikolov, PhD. I recommend the Scientific Jury to prepare a proposal to the Scientific Council of SRTI-BAS for the selection of Chief Assist. Hristo Stoyanov Nikolov, PhD at the academic position "Associate Professor" at SRTI-BAS in field of higher education 4. Natural sciences, mathematics and informatics, professional field 4.4. Earth Sciences; Scientific specialty "Remote Sensing of the Earth and Planets" for the needs of the Department "Remote sensing systems".**

28 September 2020

Reviewer: .....  
*Prof. Georgi Jeleu, PhD*

