

# ASSESSMENT REPORT

by **Prof. Ivan Ganchev Ivanov, PhD**

from Faculty of Mathematics and Informatics  
of the Plovdiv University “Paisii Hilendarski”

(Professor in the area of higher education: *4. Natural Sciences, Mathematics and Informatics*  
professional field: *4.6. Informatics and Computer Science*  
scientific specialty: *Informatics*)

on the research, teaching, administrative and societal activities

**of Head Assistant Rossitza Ivanova Goleva, PhD,**

for participation in a competition for acquiring the academic position of Associate Professor  
for the needs of the New Bulgarian University,  
announced in the Bulgarian State Gazette No. 95/16.11.2021  
in the area of higher education: *4. Natural Sciences, Mathematics and Informatics*  
professional field: *4.6. Informatics and Computer Science*

## I. General information

By Order No. 3-PK-94/06.01.2022 of the Rector of the New Bulgarian University (NBU), I have been appointed as a member of the Scientific Jury of the present competition for acquiring the academic position of Associate Professor at NBU.

The only applicant who has submitted documents for participation in this competition is **Head Assistant Rossitza Ivanova Goleva, PhD**, from the Department of Informatics at NBU.

Rossitza Ivanova Goleva was born on the 9<sup>th</sup> of May 1959 in the town of Kotel, Bulgaria. In 1982, she graduated from the Higher Machine-Electrotechnical Institute (HMEI), Sofia, with an engineering degree in “Computer Engineering” with an overall ‘very good’ grade from the semester exams (with an average score of 4.56 out of 6.00) and a ‘very good’ grade on the state exam (with a score of 5.00 out of 6.00). In 2016, the applicant obtained the educational and scientific degree “PhD” at the Technical University – Sofia after successfully defending a PhD thesis entitled “Evaluation of Models for Traffic Shaping in IP networks”. With this PhD thesis, **the applicant meets the minimum requirements of 50 points in the group of indicators ‘A’** for acquiring the academic position of Associate Professor at NBU.

## II. Research activities of applicant

Head Assistant Goleva, PhD, has (co)authored 1 Bulgarian patent and over 100 scientific works. Out of these, 26 are referenced in Web of Science, forming a Hirsch index of 7 ( $Hi=7^*$ ), and 38 are referenced in Scopus with  $Hi=7^\dagger$ . For the participation in this competition, the applicant has presented the following **16 scientific works**, which were not used by her for obtaining the PhD degree and for acquiring the academic positions of Head Assistant:

- **4 journal papers** – 2 papers [Γ7.3 and Γ7.4] published in a journal with impact factor (Q1) and 2 papers [Γ7.1 and Γ7.6] published in a journal with impact rank (SJR) but without IF;
- **5 chapters** in book series – 2 chapters [Γ8.1 and Γ8.2] published in Springer *Lecture Notes in Computer Science* (where the applicant is a book co-editor) - with SJR; 1

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\* <https://www.webofscience.com/wos/author/record/2654261>

† <https://www.scopus.com/authid/detail.uri?authorId=55376768000&origin=AuthorEval>

chapter [B4.1] published in Springer *Lecture Notes of the Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering* (where the applicant is a book co-editor) - with SJR; 1 chapter [Г7.5] published in Elsevier *Procedia Computer Science* - with SJR; and 1 chapter [B4.2] published in Springer *Advances in Intelligent Systems and Computing* - without SJR;

- **5 chapters [B4.3–B4.7] in a book** entitled *Ambient Assisted Living and Enhanced Living Environments: Principles, Technologies and Control* (without SJR), where the applicant is a book co-editor;
- **2 papers [B4.8 and Г7.2] in conference proceedings books** (with SJR).

It must be noted that some values of the impact factor (IF) and impact rank (SJR) presented in the applicant's self-assessment reference document, regarding the fulfillment of the minimum national requirements and the NBU requirements for acquiring the academic position of Associate Professor, do not correspond to the year of publication of the relevant scientific works, but rather correspond to the last year for which data are available in the relevant system.

The **16 scientific works**, presented by the applicant for participation in the present competition, can be grouped according to the instructions for points formation given in Decree No. 26/13.02.2019 of the Council of Ministers of the Republic of Bulgaria about the modification and supplement of the Regulations for the Implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria (RILDASRB), as follows:

- **2 journal papers [Г7.3 and Г7.4] with impact factor (IF).**

In her self-assessment reference document, the applicant has incorrectly indicated a lower quartile (i.e., Q2) for the scientific work [Г7.3], published in the *Sensors* journal (IF<sub>2018</sub> = 3.031/Q1), instead of the correct quartile Q1<sup>§</sup> corresponding to the year of publication. On the other hand, in her self-assessment reference document<sup>\*\*</sup>, the applicant has incorrectly assigned the scientific work [Г7.1] to this group, but in fact this work was published in the *Cybernetics and Information Technologies* journal, which has SJR, but no IF. As a result of these, the corresponding points obtained by the applicant must be corrected as follows:

- 1) In the group of indicators 'Г' – an increase of 15 points, because the scientific work [Г7.3] was published in a journal with IF / Q1, which brings 75(=3<sup>††</sup>x25p.) points, and not 60(=3<sup>††</sup>x20p.) points as incorrectly indicated in the applicant's self-assessment reference document (i.e., as a work published in a journal with IF / Q2);
  - 2) In the group of indicators 'Г' – a reduction of 30 points, because the scientific work [Г7.1] was published in a journal with SJR, but without IF, which brings 30(=3<sup>††</sup>x10p.) points, and not 60(=3<sup>††</sup>x20p.) points as incorrectly indicated in the applicant's self-assessment reference document (i.e., as a work published in a journal with IF / Q2).
- **8 papers [B4.1, B4.8, Г7.1, Г7.2, Г7.5, Г7.6, Г8.1, Г8.2] with impact rank (SJR)** but without IF.

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<sup>§</sup> <https://jcr.clarivate.com/jcr-jp/journal-profile?journal=SENSORS-BASEL&year=2018&fromPage=%2Fjcr%2Fhome>

<sup>\*\*</sup> These spotted inaccuracies have been rectified in an updated version of the self-assessment reference document, presented later by the applicant.

<sup>††</sup> An additional coefficient for multiplication of points when considering the respective indicator, adopted for the professional field 4.6 as per RILDASRB.

In her self-assessment reference document, the applicant has missed to move to this group 3 scientific works [B4.8, Γ7.5, Γ7.6], published respectively in *Proceedings - 2016 IEEE 12th International Conference on Intelligent Computer Communication and Processing (ICCP 2016)*, *Procedia Computer Science* and *Open Bioinformatics Journal*, which all have impact rank (i.e., SJR=0,124<sup>††</sup>, SJR=0,258<sup>§§</sup> and SJR=0,690<sup>\*\*\*</sup>, respectively), but rather she has incorrectly counted these as publications, which are only referenced and indexed in Web of Science. As a result of this, the corresponding points obtained by the applicant must be corrected as follows:

- 1) In the group of indicators ‘B’ – an increase of 12 points, because the scientific work [B4.8] was published in a conference proceedings book with SJR without IF, which brings 30(=3<sup>n</sup>x10p.) points, and not 18(=3<sup>n</sup>x6p.) points as incorrectly indicated in the applicant’s self-assessment reference document (i.e., as a work published in a conference proceedings book, which is only referenced and indexed in Web of Science);
- 2) In the group of indicators ‘Γ’ – an increase of 24 points, because each of the scientific works [Γ7.5, Γ7.6], as being published in an edition with SJR without IF, brings 30(=3<sup>n</sup>x10p.) points, and not 18(=3<sup>n</sup>x6p.) points as incorrectly indicated in the applicant’s self-assessment reference document (i.e., as works published in editions, which are only referenced and indexed in Web of Science).

- **6 papers [B4.2–B4.7], referenced and indexed in Web of Science and Scopus.**

8 scientific works [B4.1–B4.8] are presented by the applicant as a habilitation thesis. With these, but as a result of the above-mentioned inaccuracies, the applicant obtains a subtotal of **168 points in the group of indicators ‘B’** (instead of 156 points) which allows her to meet the minimum requirements of 100 points in this group of indicators for acquiring the academic position of Associate Professor at NBU.

With the rest of the publications presented for participation in the present competition, and by taking into account the above-mentioned inaccuracies, the applicant obtains a subtotal of **300 points in the group of indicators ‘Γ’** (instead of 291 points) which allows her to meet the minimum requirements of 200 points in this group of indicators for acquiring the academic position of Associate Professor at NBU.

All of the applicant’s publications, presented for participation in the present competition, are written in English and in co-authorship. In 5 of these publications, the applicant is listed as the first author, in 2 as the last author, and in 4 as the corresponding author. In 13 of these publications, the total number of co-authors per publication is greater than or equal to 5.

The scientific works of Head Assistant Goleva, PhD, presented for participation in the present competition, fall within the ICT areas of the Ambient Assisted Living (AAL) and Enhanced Living Environments (ELEs), and could be classified into the following three main research directions:

- 1. Development, experimentation, testing, verification and validation of AAL/ELE platforms and systems.**

Initially in [B4.3], an introduction to the world of information and communication technologies (ICT), techniques, mechanisms, and models, used for the development of AAL/ELE platforms and systems, is presented. Then in [B4.7], a combination of the Internet of Things (IoT)

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<sup>††</sup> <https://www.scimagojr.com/journalsearch.php?q=21100790044&tip=sid&clean=0>

<sup>§§</sup> <https://www.scimagojr.com/journalsearch.php?q=19700182801&tip=sid&clean=0>

<sup>\*\*\*</sup> <https://www.scimagojr.com/journalsearch.php?q=19700201613&tip=sid&clean=0>

with the cloud computing, machine learning algorithms, electronic health records' (EHR) information systems, and wireless body area networks (involving portable sensors) is considered for the provision of relevant AAL/ELE services, by identifying challenges and problems related to security and privacy, and difficulties in dealing with huge amounts of generated data and interoperability.

[Γ8.1] describes the integration of different technologies into an AAL/ELE system architecture, allowing the collection (in real time, through biosensors) and processing of data on the physiological condition of users-patients in order to determine their medical status. The architecture was tested in laboratory and real-world conditions, and in addition an analysis was carried out on the collected data with regard to finding correlations between different variables.

In [B4.4], a developed architecture of a generic AAL/ELE platform is presented, by detailing its main layers, functionalities, and services provided, as well as the ICT, communication protocols and interfaces used to enable interoperability with other platforms. A detailed classification of the traffic flows exchanged between the relevant communicating components of the platform is presented along with the types of processed data.

In [B4.6], an elaborated model of a cloud-based AAL/ELE system is presented, whose logical and physical structures are complemented by a description of the life cycle of the exchanged messages and possible usage scenarios.

In [B4.5], possible scenarios for testing, verification, and validation of AAL/ELE platforms are considered at different levels and across different domains, performed by end users (classified as primary, secondary, and tertiary users) with respect to meeting their requirements for functionality, connectivity, and interoperability, as well as to the communication protocols and interfaces used.

## **2. Improving the quality of service (QoS) provided by AAL/ELE platforms and systems.**

Initially in [Γ7.5], an analysis of the quality of service achieved with different configurations of the developed 3-stage AAL/ELE platform has been carried out, whereby the experimental results prove the applicability of the platform for the exchange of both non-critical and critical data (by setting appropriate priorities for the latter).

In [B4.1], an approach for using the so-called duplicate "peer port" is proposed in order to increase the quality of service in terms of reliability of communication between the sensor and cloud layers of a developed AAL/ELE platform. The approach, which was successfully demonstrated in laboratory conditions, is dynamic, flexible, and compliant with the home automation and eHealth requirements.

The approach of using a duplicate "peer port" is laid down also in the concept of the multi-layer AAL/ELE platform, called AAPELE, presented in [B4.2], and its usefulness was confirmed by the conducted experiments. The platform itself is able to operate independently of the network connectivity and is open to migration to new technologies.

Duplicate "peer ports" are also used in the decentralized "fog" communication solution, proposed in [Γ7.2], by utilizing P2P-CDN communication infrastructures to provide AALaaS cloud services (AAL as a Service) with high reliability requirements but via unreliable networks, which has been demonstrated through simulations and conducted laboratory experiments.

## **3. Software tools, methods, techniques, and algorithms in support of the functioning of AAL/ELE platforms and systems.**

In [Γ7.4], a method for automated extraction of (and selection of appropriate) features from data, collected by means of sensors located on the human body, is proposed in order to improve the accuracy of recognition of Activities of Daily Living (ADL) of users-patients and to create reliable classification models, based on machine learning algorithms. The elaborated method, intended for use in AAL/ELE systems, has been evaluated on five publicly available data sets, and the obtained results confirmed its capabilities to achieve higher classification accuracy and to shorten the required execution time compared to manual extraction methods. Moreover, the proposed method can reduce the development cost of AAL/ELE systems by facilitating the execution of classification algorithms on mobile devices with limited computing and energy resources, and in addition it can recommend the use of as few sensors as possible (along with their combination), optimally located on the human body.

In the review paper [Γ7.3], a comparative literature analysis of methods and techniques, mainly utilizing machine learning, has been carried out with respect to getting audio fingerprints, which can be applied to accurately identify and determine the type of sounds (acoustic data) intercepted (sent) by microphones of the consumers' mobile devices in order to identify the type of the surrounding environment and increase the accuracy of identification of users'/patients' ADL. Based on a conducted analysis, specific methods and techniques have been recommended for use in AAL/ELE systems which utilize mobile devices (with limited capabilities) for audio fingerprinting.

[Γ7.6] describes the developed Android software library, which includes methods for fusion and processing of data (collected by means of Android-based mobile devices equipped with built-in sensors) of the physiological state and ADL of users-patients, along with the surrounding environment, and for the extraction of appropriate data features, as well as relevant classification methods utilizing neural networks. In general, the library allows to improve the classification performance as per the quality indicators used and can serve as a basis for developing a "personal digital life coach" mobile application for use in AAL/ELE systems.

In [B4.8], an Android-based mobile application is presented for periodic (over a determined optimal time interval) GPS tracking of mobile devices of (adult) patients, with an additional possibility for sending SMS notifications to third parties when patients leave the designated areas. The developed application has been compared with another similar application (for GPS tracking and tracing) in terms of the achieved localization accuracy and energy efficiency, whereby a better performance was attained on the former criterion and a slightly worse performance on the latter.

In [Γ7.1], a multi-server  $M(g)/M(g)/n/k$  queueing discipline with state-dependent arrival and departure processes has been proposed, which can be used to provide an ELE as a Service (ELEaaS) in the cloud. A generalized Erlang-C formula has been used to describe the arrival and service flows with nonlinear state dependence intensities on the system state with defined so-called "peak factors", the influence of which on the queueing behavior has been assessed. The simplicity and uniformity of the presentation of both peaked and smooth behavior make the proposed discipline particularly attractive for controlling and smoothing out the traffic flows in AAL/ELE systems.

In [Γ8.2], a developed software NLP toolkit is presented that allows automation of big part of the review and analysis process (based on keywords and key phrases) of the abstracts of scientific papers indexed in the IEEE Xplore, PubMed, and Springer digital libraries. The applicability of the toolkit is demonstrated by performing an automated analysis of papers, falling within the AAL and ELE areas, in accordance with the PRISMA methodology. The study proves that the developed toolkit can significantly facilitate and speed up the review and analysis process by presenting

valuable insights from the researched papers without the need for their actual reading, while being also able to generate informative tables, charts, and graphs. In doing this, the toolkit can recommend the most appropriate papers (on a specific topic) for subsequent reading in order to study and utilize methods, techniques, and algorithms for improving the functioning of AAL/ELE platforms and systems.

Head Assistant Goleva, PhD, has presented a list of over 300 citations of her scientific works, of which **20 citations** (of 9 scientific works of her) are selected for participation in the present competition. It should be noted that some of the citations in the applicant's self-assessment reference document\*\* include neither weblinks to the corresponding reference databases, nor any evidence that would have facilitated the verification of these. Citation No.7 has got two common authors (C. Mavromoustakis and G. Mastorakis) with the cited work [B4.3], i.e., this is a self-citation which must be excluded from the list and the total number of applicant's points, obtained in the group of indicators 'Д', must be reduced by 8 points. In addition, the presented as a citing publication No.20<sup>†††</sup>, in fact, does NOT cite any of the applicant's scientific works (?!), which requires another reduction of 8 points. Thus, the citations, presented by the applicant for her participation in this competition, form a subtotal of **144 points in the group of indicators 'Д'**, and not 160 points as incorrectly stated in the self-assessment reference document, which, however, allows the **applicant to cover (almost thrice) the minimum requirements of 50 points** in this group of indicators for acquiring the academic position of Associate Professor at NBU.

The 18 citations, recognized by me, could be grouped as follows:

- **15 citations** (No. 2–6, 8–12, 14–18) published in editions that are **referenced and indexed in Web of Science and Scopus** – with a subtotal of (15x4<sup>||</sup>x2p.=) **120 points**;
- **3 citations** (No. 1, 13, 19) published in editions that are **referenced and indexed only in Scopus** – with a subtotal of (3x4<sup>||</sup>x2p.) **24 points**.

All 18 recognized citations are written by foreign authors.

To date, Head Assistant Goleva, PhD, has participated in over 35 scientific and educational projects, but in the present competition she participates with only 7 of these. In the applicant's self-assessment reference document, however, there is insufficient conclusive evidence of her **active** participation in 3 national scientific projects (i.e., E.14.1, E.14.3, E.14.4), out of the presented 4 projects of this kind, and in 1 international scientific project (i.e., 15.3), out of the presented 3 projects of this kind. For this reason, I consider appropriate to halve the relevant number of points for participation in those projects, i.e., a reduction by 15(=3x5p.) points for the national projects and by 10(=1x10p.) points for the international projects. On the other hand, however, the applicant has 1 co-leadership of an international project E.17 (and, in fact, very successful on my personal impression!), which is presented (and can be accepted as such) as a leadership of a Bulgarian team in an international scientific project due to the absence (?!) of a category "(co)leadership of an international scientific/educational project" in the relevant table of RILDASRB. This way, I think that the **applicant obtains** a subtotal of not 150 points, but rather **125 points in the group of indicators 'E'**, for which, however, **there are no minimum requirements** specified for acquiring the academic position of Associate Professor at NBU.

In the group of indicators 'Ж', among the documents submitted by the applicant, sufficient conclusive evidence was not found for the following indicators: "Ж.21. Existence of a research or creative program", "Ж.28. Presented public **lectures on behalf of NBU based on invitation** received from Higher Educational Institutions or prestigious national/international

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<sup>†††</sup> <https://link.springer.com/content/pdf/10.1007/s00542-020-04940-4.pdf>

organizations..." and "Ж.29. Initiating/actively participating in the creation of a successful new program", which is why I consider appropriate to reduce the total number of points, obtained by the applicant in this group, by: 10 points for indicator Ж.21 (i.e., in full), 5 points for indicator Ж.28 (i.e., by half) and 5 points for indicator Ж.29 (i.e., by 1/3). Thus, **in the group of indicators 'Ж', the applicant obtains** a subtotal of **115 points**, and not 135 points, with which, however, she **covers (by more than double) the minimum requirements for 50 points** in this group of indicators for acquiring the academic position of Associate Professor at NBU.

Additionally, Head Assistant Goleva, PhD, has reviewed numerous scientific papers submitted for publication in international journals, books, and conference proceedings books, as well as many project proposals for participation in the European scientific programs and competitions. In addition, she provides also research consultancy services to Bulgarian and foreign companies.

### **III. Teaching activities of applicant**

Head Assistant Goleva, PhD, has got an extensive (35-year) teaching experience in the higher education system – initially as a Research Associate and later as a Head Assistant in the Department of Communication Networks at the Technical University – Sofia (until 2017), and subsequently (up to now) as a Head Assistant in the Department of Informatics at NBU. Prior to that (from 1982 to 1987) she worked as a Research Associate at the Research Institute of Communications, Sofia. To date, Head Assistant Goleva, PhD, has taken part in the development and teaching of over 25 ICT modules in both undergraduate and graduate courses in these universities. She is also a co-author of 2 textbooks for students. While working at NBU, Head Assistant Goleva, PhD: has created teaching materials on Operating Systems for three modules in the bachelor's program "Network Technologies" (in English), has been a supervisor of 5 successfully graduated bachelor students, has prepared 10 reviews of bachelor theses, has 5 participations in the panel for evaluating the defenses of bachelor theses, and in the last two years has participated in the national program for student internships of the Ministry of Education and Science of the Republic of Bulgaria. This way, according to the information provided in the submitted documents, **the applicant obtains** a subtotal of **70 points in the group of indicators 'Ж'**, thus **meeting the minimum requirements for 70 points** in this group of indicators for acquiring the academic position of Associate Professor at NBU.

Additionally, Head Assistant Goleva, PhD, is a Coordinator of the Moodle training program of the Department of Informatics at NBU and participates in the training sessions provided by the university library. It is apparent from the submitted documents that she regularly participates in the department meetings, adheres to her admission/consultation time with students, and regularly conducts her classes with students. Among the documents submitted by the applicant for the group of indicators 'И', sufficient convincing evidence was not found only for indicator "И.44. Participation/supervision of a project on which **external funds** and/or **students from NBU have been attracted**", for which the corresponding number of points must be appropriately reduced by 10 points (i.e., by half). Thus, in my opinion, **the applicant obtains** a subtotal of not 65 points, but rather **55 points in the group of indicators 'И'**, thus **meeting the minimum requirements for 50 points** in this group of indicators for acquiring the academic position of Associate Professor at NBU.

### **IV. Administrative and societal activities of applicant**

Currently, Head Assistant Goleva, PhD, is a Director of the Program Board of the Department of Informatics at NBU. The submitted documents confirm that she was also involved

in conducting interviews with student applicants for the master's programs of the department. In addition, over the past 18 years she has been actively involved in the activities of the Bulgarian chapter of the world's largest professional organization – the Institute of Electrical and Electronics Engineers (IEEE) – initially as a Vice Chair of the chapter and subsequently as its Chair, Secretary, Vice Chair (again), and Vice Treasurer.

## V. Personal comments

I do personally know Head Assistant Goleva, PhD, for many years now and I do consider her as an excellent professional doing properly her job (in every respect) and a superb individual on a personal level. Recently I have participated in an international project (COST Action IC1303 – Algorithms, Architectures and Platforms for Enhanced Living Environments, AAPELE<sup>+++</sup>), co-led by her, and I have been extremely impressed by her way of working with the team members, her dedication and responsiveness to solving problems of all kinds during the project development, her exceptional energy with regard to the organization, coordination, control, and accomplishment of project tasks, as well as the excellent attitude of all team members (from 34 countries!) towards her, respected by her overall fascination, behavior, and prestige, which even at that time suited the level of a renown international scientist with a habilitation, serving as a true example model for young scientists.

## VI. Assessment of compliance of the applicant's activities to the minimum requirements

Based on the presented documents, I do consider that the applicant in this competition, **Head Assistant Rossitza Ivanova Goleva, PhD, meets the minimum required point criteria<sup>\$\$\$</sup> in each group of indicators for acquiring the academic position of Associate Professor at NBU** (by obtaining a **total of 1027 points**) and meets the minimum requirements for scientific research activity of the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), the RILDASRB, and the Ordinance on the development of academic staff in NBU – in the part regarding the academic position of Associate Professor.

## VII. Conclusion

Overall, **I give my positive assessment of the research, teaching, administrative, and societal activities of Head Assistant Rossitza Ivanova Goleva, PhD, for her participation in the present competition for acquiring the academic position of Associate Professor at NBU and I propose her application to be allowed to progress to the Academic Council of NBU for the election of an Associate Professor.**

March 31, 2022  
City of Plovdiv

Prepared by: .....  
(Prof. Ivan Ganchev Ivanov, PhD)

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<sup>+++</sup> <https://www.cost.eu/actions/IC1303/#tabs+Name:Management%20Structure>

<sup>\$\$\$</sup> In my personal view, **the minimum point criteria** in the groups of indicators for the acquiring of scientific degrees and holding of academic positions in the Republic of Bulgaria **are extremely low** at the moment (**with regard to all degrees and positions, and in all professional fields**) and thus must be updated reasonably in near future. However, with her additional scientific publications, citations, participation in projects, and other activities, which are not presented for participation in the present competition, **the applicant would meet even higher criteria for acquiring the academic position of Associate Professor.**