

OPINION

for a competition for the occupation of the academic position of "professor" in the field of higher education **4. Natural Sciences, Mathematics and Informatics**, professional direction **4.5. Mathematics**, specialty "**Mathematical modelling and application of mathematics (in ecology)**", announced in State Gazette issue 49 / 21.06.2019 for the needs of section "Scientific calculations" in IICT - BAS

Candidate - Assoc. Prof. Dr. Krasimir Todorov Georgiev

by a member of the Scientific Jury, Prof. Dr. Emil Manoach from the Institute of Mechanics-
BAS

1. General characteristics of the presented materials

Assoc. Prof. Krasimir Georgiev is the author of 113 scientific publications and has presented 51 publications for participation in the concurs. A very large number of them are indexed in the worldwide databases - 22 are in Impact factor journals and 25 are in SJR journals. The candidate has conditionally merged 5 of the five papers in a habilitation work. These are the publications with the numbers B4.1-B4.5 from the list of publications submitted for the competition.

The candidate has provided a list of 52 citations to his work, those citations being in IF or SJR journals.

2. General characteristics of the applicant's scientific, pedagogical and applied activities

Associate Professor Krasimir Georgiev is an established scientist in the field of applied mathematics, mathematical and computer simulation, solving various problems related to the processes of transfer of pollutants, problems related to seismic and structural mechanics, as well as problems related to computational methods on supercomputer architectures.

The applicant has participated and managed many national and international projects.

According to the information from the National agency for evaluation and accreditation, he led the Bulgarian team in 5 international projects and 4 Bulgarian projects (3 of them with the NSF) and participated in the implementation of 10 other international and 6 Bulgarian projects.

3. Brief analysis of scientific and applied scientific achievements according to the materials submitted for participation in the competition.

The author's reference for the contributions to the works of Assoc. Prof. Krasimir Georgiev presented for participation in the competition is written clearly and systematically, describing the main contributions of the works. A brief summary of each of the attached publications is attached separately.

The candidate has classified his work into four main thematic groups:

- **Mathematical and computer modelling of airborne contaminant transfer processes. The relationship between air pollution and climate change. Simulations on different types of supercomputer architectures .**
- **Mathematical and computer modelling of processes and phenomena in mechanics, medicine, etc. with computer experiments on parallel computer architectures.**
- **Studies related to the Richardson extrapolation and the Runge-Kuta methods in solving important problems in computational practice.**
- **Studies related to tasks arising from seismic and structural mechanics**

The first group of works included 21 papers of the applicant, the second - 17, the third - 9, and the fourth group - 4 papers.

Prof. Georgiev's scientific works show that he has a broad knowledge in the field of mathematical and computer modelling of complex processes and phenomena, that he is a specialist in numerical modelling of practical problems, that he is proficient in applying numerical methods to various computer architectures.

The papers in all three groups have been published in many reputable journals such as: *International journal of environment and pollution*, *Applied mathematical modelling*, *Computers & mathematics with applications*, and others.

The works of the first group occupy the largest part of the creativity of the author. In addition to addressing major environmental and climate change issues, it is typical that ultra-large computational problems are solved. Attacking such tasks, making optimum use of existing computing equipment, splitting tasks to solve a sequence of simpler tasks, the so-called "substructuring", etc. techniques themselves require a great deal of serious knowledge and skills in both mathematical modelling and computer science. The applicant demonstrates that he has such knowledge and skills.

Large in scope and complexity are also those works related to applications in mechanics, thermal tasks, seismic and construction mechanics tasks and medicine. The solution of these problems new algorithms (parallel ones) were created and applied, as well as fast methods for solving systems of algebraic equations were developed.

The applicant has worked in cooperation with a large number of foreign and Bulgarian specialists on all these tasks.

4. Reflection of the candidate's work in the works of other authors. Numerical indicators.

The work of the applicant has not gone unnoticed by scientists working in the field. The works have been cited 52 times, and for the most part they are completely independent citations from foreign authors. All citations submitted by the applicant are in IF or SJR journals. 16 of these are in articles in Impact Factor journals in Q1 of WoS.

5. In the case of collective publications, reflect the contribution of the applicant.

Kr. Georgiev works on many complex tasks in most cases requiring interdisciplinarity. This is evident from the authors of the articles. Of the works submitted for the competition, Kr. Georgiev is the author of 2 independent publications. The rest are co-authored, with 12 being the first author.

My impression is that the contribution of Assoc. Prof. Georgiev is at least equivalent to that of the other co-authors. The applicant is a specialist in numerical modelling of complex tasks and his quality has been demonstrated in all publications with other co-authors.

6. Critical notes and recommendations of the reviewer.

I have no critical remarks.

7. The personal impressions of the reviewer for the applicant and the satisfaction of the additional requirements specified in the rules for the conditions and procedure for acquiring scientific degrees and for occupying academic positions at the Institute of Information and Communication Technologies

I know Assoc. Prof. Georgiev as a colleague from an institute in the thematic field in which I work as an erudite and competent specialist in numerical methods and algorithms. I have excellent impressions of him both in a professional and in a purely human ways as a very kind and helpful colleague.

Krassimir Georgiev has collected points on indicators that far exceed all 5 thresholds needed to satisfy the requirements for a professor of BAS and IICT.

8. Conclusion

The analysis of the submitted materials in the competition shows that Assoc. Prof. Georgiev fully meets the requirements of the Law of the development of the academic staff and the recommended requirements of IICT - BAS for acquiring the academic position of Professor.

For these reasons, I recommend that the scientific jury to offer to the Scientific Council of the Institute of Information and Communication Technologies to vote for Assoc. Prof. Krasimir Todorov Georgiev to become a professor in the professional field **4.5. Mathematics, specialty Mathematical Modelling and Application of Mathematics.**

September 14, 2019

Sofia

Signature:

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/ Prof. Emil Manoach /