Referee report

for the academic position of "Professor" in the professional field 4.5. Mathematics, major in Mathematical Modeling and Application of Mathematics (Monte Carlo and Quasi-Monte Carlo Algorithms and Applications), published in State newspaper, no. 41 of May 21, 2019; the position for the Department of Grid Technologies and Applications section (new name: "High Performance Systems, Networks and Algorithms" with the sole candidate, namely, Assoc. Prof. Dr. Todor Vassilev Gurov

Reviewer: Prof. DSc.Ivan Tomov Dimov,
Institute of Information and Communication Technologies, Bulgarian Academy of Sciences

The following documents were submitted to the reviewer:
1. European CV.
2. A copy of the diploma of the doctoral degree.
3. Certificate of internship in the specialty.
4. List of scientific publications for the competition which do not repeat the ones submitted for acquiring a doctorate degree and borrowing academic post of Associate Professor.
5. List of citations (Part One 05-A, Part Two 05-B).
6. Abstracts of the scientific publications for participation in the competition - in Bulgarian.
7. Abstracts of the scientific publications for participation in the competition - English.
8. Reference for meeting the minimum requirements of IICT-BAS.
9. Reference for original scientific and applied scientific contributions.
10. Declaration that the applicant has not been shown by lawful plagiarism in scientific works.
11. Assurances (Declarations) by the Project Manager for the Manager / Contractor of the project.
12. List of projects for the competition.
13. Copies of all scientific publications for participation in the competition.

1. General characteristics of the scientific results

The candidate assoc. Prof. Todor Vassilev Gurov participates in the competition for professor with publications, the list of which includes 26 scientific papers, 6 of which are included in the list for collecting points by group index B, and 20 publications are for the list with group indicator D, according to the rules of IICT-BAS. All 26 publications are visible in SCOPUS, as: 4 publications have Impact Factor (IF) [1, 2, 3, 4]; 18 publications have SJR index [5 - 13, 16 - 18, 21 - 26]; one chapter from a book [19]; 3 publications are visible in SCOPUS without SJR index [14, 15, 20].

Of the 26 works submitted, I do not consider works with numbers [3,6] as I am a co-author of the candidate in these works. All submitted papers for the competition were published after the

election of Todor Gurov as associate professor (Assoc. Prof. II.); the Minutes of the Council of Ministers of the Council of Ministers, cited in its diploma, dated 26.03.2004. Therefore, none of the publications was used in the previous competition.

74 citations to 21 of his work in Scopus / WoS are documented in the applicant's material, as well as 100 citations to 32 of his publications other than SCOPUS / WoS. This data indicates a very good international recognition of the applicant.

In this sense, the scientific problems considered and the problems solved by him in the scientific publications presented are within the professional field 4.5. Mathematics, specialty "Mathematical modeling and application of mathematics (Monte Carlo and quasi-Monte Carlo algorithms and applications)".

2. Contributions contained in submitted works for review

The obtained results can be characterized as creation, research and parallel realization on modern computing systems of new Monte Carlo quasi-Monte Carlo methods and algorithms.

The results can be structured in the following directions:

1. Development of Monte Carlo and hybrid Monte Carlo algorithms for simulating quantum transport and electronic transport in ultra-small devices in mixed mode [2, 5, 6, 8, 13].
2. Development of the SALUTE Grid application (Stochastic ALgorithms for Ultra-fast Transport in sEmiconductors), by integrating several Monte Carlo, quasi-Monte Carlo and hybrid algorithms for solving quantum-kinetic equations [7, 10, 12, 19]
3. Monte Carlo approach for the rendering equation (Cook-Torrance model) and for the recovery of follow-up densities [3, 18].
4. Investigating the sensitivity of MK and quasi-MK algorithms for solving multidimensional integrals and integral equations with different random number generators and applying dispersion reduction techniques [9, 11, 14, 16].
5. Investigation of scalability and energy efficiency of intensive Monte Carlo and quasi Monte Carlo algorithms on supercomputer systems [1, 17, 21, 22, 24, 25, 26].

3. Publications and citations of publications participating in the competition

The relevance and importance of scientific and applied contributions are indisputable. They follow from the fact that the majority of publications are in reputable specialized publications with an impact factor.

Todor Gurov has documented 74 citations of 21 of his works in Scopus / WoS, as well as 100 citations of 32 of his publications to other databases other than SCOPUS / WoS. Of the publications submitted for the competition, none are independent, but in this field it is natural to work in teams. At the same time, there is no doubt about the candidate's personal involvement. In each of the collaborations, the applicant makes the necessary substantial

contribution. Nevertheless, in the future, I recommend that the applicant also publish freelance work.

4. Educational activity and participation in projects

Assoc. Prof. Todor Gurov has noted in his curriculum vitae for university courses. For example, STAM205, Monte Carlo Methods, Part I and Part II, 60 hours, 6 credits, Master's Degree Program in Applied Statistics, New Bulgarian University, 2009. He also had two PhD students (Vera Koleva-Efremova and Dobromir Georgiev) who were dismissed this year with the right to defense. I know that he also took the specialized course "Introduction to Parallel Calculations", which was offered at the BAS Training Center. This is Theme: 1.4.15 on the Website:

http://edu.bas.bg/doctorant_school/spec_courses/1_inf_com_sci_tech/information.html

He has successfully participated in a number of national and international scientific projects. In seven of the international scientific and educational projects he was the head of the Bulgarian team. He has participated in 4 national scientific projects. He was a member of a team of 7 international scientific projects and 6 national scientific projects. As a leader of the Bulgarian team of successfully completed international and national projects, the applicant has acquired skills in project management and fundraising.

He has played a leading role in building regional Grid and HPC infrastructures over the years, creating software products to assess brown bear populations and a system for accounting for end-user computing resources (Accounting system) for the region. This experience has helped him to successfully fulfill the functions of the Deputy Director of the Institute.

5. Comments and recommendations

I have no particular remarks and recommendations for Todor Gurov. I have noticed some small inaccuracies in the quotations and wording in some of the articles. The inaccuracies noted do not in any way diminish the merits of the research of Assoc. Prof. Gurov, who is a well-established leading specialist.

6. **CONCLUSION**: Based on the aforementioned, it is clear that the candidate for the announced competition Assoc. Prof. Todor Vassilev Gurov fully complies with the requirements of the ZRASRB, the Rules for the implementation of the ZRASRB, the Rules for the conditions and procedure for acquiring academic degrees and for occupying academic positions in the Bulgarian Academy of Sciences, as well as the Rules for the Specific Conditions for Acquisition of Academic Degrees and Occupation of Academic Positions at the Institute of Information and Communication Technologies at the

Bulgarian Academy of Sciences.

The achieved scientific results give me a reason to propose the selection of the candidate Assoc. Prof. Todor Vassilev Gurov as a professor at IICT-BAS in the professional field 4.5. Mathematics, specialty "Mathematical modeling and application of mathematics (Monte Carlo and quasi-Monte Carlo algorithms and applications)", announced in the State Gazette no. 41 of May 21, 2019, for the needs of the Grid Technologies and Applications section (new name: "High-performance Systems, Networks and Algorithms"). Therefore, my conclusion is to occupy the academic position "Professor" announced by Assoc. Todor Vassilev Gurov is POSITIVE.

08/24/2019
Sofia

Signature:

/ Prof. Ivan Dimov /