

OPINION

in a competition for an academic position "Associate Professor"
in a professional direction 4.5. Mathematics (Mathematical modeling and application of
mathematics in mechanics and robotics),
for the needs of Sofia University "St. Kliment Ohridski "(Sofia University),
Faculty of Mathematics and Informatics (FMI),
announced in State Gazette no. 21 from 15.03.2022. and on the websites of FMI and Sofia
University

The opinion was prepared by: Prof. Dr. Emil Samuil Manoah, Institute of Mechanics - BAS,
as a member of the scientific jury of the competition according to Order № RD-38-234 /
11.05.2022: of the Rector of Sofia University.

Only a candidate has submitted documents for participation in the announced competition:
Ch. Assistant, Dr. Alexander Alexiev Stefanov from FMI at Sofia University "St. Kliment
Ohridski "

I. General description of the submitted materials

1. Candidate data

The documents submitted by the competition by the candidate comply with the requirements
of ZRASRB, PPZRASRB and the Regulations on the terms and conditions for obtaining
scientific degrees and holding academic positions at Sofia University "St. Kliment Ohridski" .

For participation in the competition, the candidate Alexander Alexiev Stefanov presented a
habilitation thesis consisting of 6 papers - 2 articles in journals indexed in Scopus (Q3) and 4
articles in conference proceedings - 2 of them indexed in Scopus with SJR.

Apart from the habilitation thesis, the candidate participates in the competition with 10
papers, of which 1 article in a journal in Q1, 4 articles in journals in quartile Q2, 1 in a journal
in Q3 and one in a journal in Q4. Three other of the articles presented are in journals with SJR
without quartiles. A number of other documents required for participation in the competition
are presented: CV, diplomas for bachelor, master and doctor, certificates from the employer,
etc.

It is noteworthy that the documents submitted for participation in the competition are very well formed, arranged, structured, which facilitates the work of reviewers.

2. Details of the candidate

Dr. Alexander Stefanov graduated from the Faculty of Physics at Sofia University, obtaining a bachelor's degree in "Engineering Physics" in 2010 and a master's degree in "Theoretical and Mathematical Physics" in 2016. Since 2015 he has been working as an assistant at the Faculty of Mathematics at Sofia University, and since 2017 he has been a senior assistant. The candidate has been working part-time as an assistant and at IMI at BAS since 2015.

He successfully defended his dissertation for the scientific and educational degree "Doctor" in 2016 at the Faculty of Physics at Sofia University, majoring in "Theoretical and Mathematical Physics". The topic of the dissertation is "Nonlinear dynamical systems related to infinite Lie algebras"

3. General characteristics of the scientific works and achievements of the candidate

The candidate's education, of course, gives an imprint on the scientific works and the results of his work. Dr. Alexander Stefanov is the author of a total of 24 scientific papers, half of which are in scientific journals, and the other half - in conference papers. 7 of these papers are included in the candidate's dissertation and are not included in the competition materials.

The candidate has papers published in major journals and proceedings of authoritative conferences. There are 2 articles in journals with quartile Q1; with Q2 - 5 articles, Q3 - 3 articles; Q4 - 1 article; with SJR without quartile - 8 articles.

Most of the works are related to the field of mathematical physics: the study of integrable generalizations of nonlinear equations of mathematical physics, such as the Korteweg-de Vries equation and the nonlinear Schrödinger equation. A series of works of the candidate are dedicated to the measurement of fundamental physical constants, and another 2 - with modelling, research and control of walking robots. A. Stefanov has articles on optics and quantum information.

The scientific works with which A. Stefanov participates in the competition fully cover the minimum national requirements and the additional requirements of Sofia University "St. Kliment Ohridski" for holding the academic position of "Associate Professor" in the scientific field of the Mathematics competition; The candidate has an educational and scientific degree

"Doctor", has presented a habilitation thesis - scientific publications in publications that are referenced and indexed in world-famous databases of scientific information (Web of Science and Scopus) and collects 186 points; he has also presented scientific publications in publications that are referenced and indexed in world-famous databases of scientific information (Web of Science and Scopus), outside the habilitation work collecting 486 points; his works have been cited 7 times in publications indexed in Web of Science and Scopus and there are 7 other citations

The scientific papers submitted by the candidate do not repeat those of the procedure for obtaining the scientific degree "Doctor";

There is no evidence of plagiarism in the scientific papers submitted to the competition.

4. Characteristics and evaluation of the teaching activity of the candidate

I have no personal impressions of the candidate's teaching activity, but judging by the report presented on his lectures and exercises, as well as his participation in the organization and conduct of Olympiads, it is significant and successful.

5. Content analysis of the scientific and scientific-applied achievements of the candidate contained in the materials for participation in the competition

The main scientific contributions of the candidate in the study of nonlinear equations of mathematical physics. The author has grouped his scientific works into 5 groups - integrable models, robotics, electronics and measuring physics and optics. The most significant works fall into the first group, which contains the largest number of articles. Many of them in journals and conference proceedings with impact factor or SJR. These works also show the candidate's excellent mathematical training, his knowledge of Lie algebras, recursion operators and other mathematical techniques. Results have been obtained, which are summaries of existing models, new approaches have been applied to solve certain problems. The results undoubtedly enrich the existing knowledge. Significant results have also been published in the works included in the third group of works. For example, a TAC modelling the dynamic behaviour of operational amplifiers is derived. This model was used to consider three important problems for measurement physics. Also important are the works from this group dedicated to the measurement of fundamental constants, in a way accessible to students. The work on robotics includes the development of a dynamic model of a walking robot with two degrees of freedom,

an algorithm for its control and an experiment was performed, confirming the results of the model. The work on optics is dedicated to a method for generating diffraction-free Gauss-Bessel laser radiation by anachylation of optical vortices. The broad scientific interests of the candidate are complemented by his work on quantum information, which, in my opinion, could be relevant to quantum computers.

The obtained results did not go unnoticed and were cited 14 times, as 7 times - in editions with impact factor or SJR.

All publications of the candidate are co-authored. In two of them (those in robotics) he is the first author, and in most of the others he is the third or second author - after the names of famous Bulgarian physicists such as Gerdjikov, Mishonov and Mladenov. I accept that the contribution of A. Stefanov is equal to that of his co-authors.

6. Critical remarks and recommendations

I have no critical remarks.

7. Personal impressions of the candidate

I do not know the candidate and I have no personal impressions

8. Conclusion on the application

After getting acquainted with the materials and scientific papers presented in the competition and based on the analysis of their importance and the scientific and scientific-applied contributions contained in them, I confirm that the scientific achievements meet the requirements of ZRASRB, Regulations for its application and relevant Regulations of Sofia University "St. Kliment Ohridski " for holding the candidate for the academic position "Associate Professor " in the scientific field and professional direction of the competition. In particular, the candidate satisfies the minimum national requirements in the professional field and no plagiarism has been established in the scientific papers submitted at the competition.

I give my positive assessment of the candidacy.

II. OVERALL CONCLUSION

Based on the above, I recommend the scientific jury to propose to the competent body for the selection of the Faculty of Mathematics and Informatics at Sofia University "St. Kliment

Ohridski "to choose Alexander Alexiev Stefanov to take the academic position of" Associate Professor "in a professional field Mathematics (Mathematical modelling and application of mathematics in mechanics and robotics)

.20.06. 2022....

Prepared the opinion:.

Prof. Dr. Emil Manoach.