

## OPINION

According to a competition for the academic position "Associate Professor"  
Higher Education Area 4. Natural Sciences, Mathematics and Informatics,  
Professional Field 4.5 "Mathematics" (Higher Mathematics).

Announced in the State Gazette, No. 45/17.06.2022  
for the needs of the Department of Mathematics and Physics  
at the University "Prof. Asen Zlatarov", Burgas.

Candidate: Chief Assistant Professor Stancho Valkanov Pavlov, PhD

Reviewer: Corr. Member of BAS, Prof. D.Sc. Nikolai Marinov Nikolov,  
Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences

### **General conditions and biographical data of the candidate**

In the competition for the occupation of the academic position "Associate Professor", announced in SG no. 45/17.06.2022 for the needs of the Department of Mathematics and Physics at the University "Prof. Asen Zlatarov", Burgas, as the only candidate participated Chief Assistant, PhD Stancho Valkanov Pavlov from the Department of Mathematics and Physics at the University "Prof. Asen Zlatarov", Burgas.

Stancho Pavlov is born in Burgas in 1958. He graduated from secondary school in Science and Mathematics Gymnasium "Nikola Obreshkov" in his hometown and higher education at Plovdiv University "Paisiy Hilendarski"; specialty "Mathematics" in 1981. He worked for 2 years as a programmer in a computing center, and from 1982 to 1989 he worked as a teacher at the SMG "Nikola Obreshkov", Burgas. From 1998 to the present, he has been working as Chief Assistant Professor of Mathematics at the Department of "Mathematics and Physics" at the University "Prof. Dr. Asen Zlatarov", Burgas.

Since 2015, he is a doctor in Professional Field 4.6 "Informatics and Computer Sciences".

### **Pedagogical activity**

Ch. Assist. Stancho Pavlov is a long-time teacher at the University "Prof. Dr. Asen Zlatarov" and Technical College, Burgas. He conducts seminars "Higher Mathematics – part 1" and "Higher Mathematics – part 2" for undergraduate students from all disciplines. He also leads seminar classes in mathematics for foreign students.

He maintains a website with over 300 published pages, covering the material he teaches, without being limited to the material included in the disciplines. Its volume is 3 gigabytes. The site is supported by a popular science and scientific journal. In the reference for teaching and methodical work, he attached part of the sections of the site and the titles of its pages.

Three textbooks on Higher Mathematics – first, second and third parts and one book entitled "Remarkable Curves" have been published. He applied their contents.

The presented factology is an objective testimony of the multifaceted and active educational activity of Ch. Assist. Stancho Pavlov. It gives me a reason to believe that the pedagogical activity of the candidate fully corresponds to the requirements for acquiring the academic position "Associate Professor".

### **The scientific research and scientific-applied activity of the candidate**

His scientific interests are in the field of information technology, programming, computer simulations, research of dynamic systems, mathematical theory of catastrophes, etc.

22 scientific publications were submitted for participation in the competition (Appendix 1), of which 4 in referenced and indexed in world-known scientific information databases (Scopus) (Indicator B 4), 4 in non-refereed journals with scientific review Appendix 1 (Indicator D \*7-18).

32 citations in scientific works (Appendix 4), two participations in an international scientific or educational project and 15 participations in topics developed in the Scientific Research Sector of the University "Prof. Dr. Asen Zlatarov", Burgas (item 9 of the attached documents).

Certificate of a patent, filed on 08.12.2018, registered under application No. 112845 for the invention "Combined bridge" with inventors Stancho Pavlov and Dimo Yanev. The given indicators are in accordance with the declaration of the minimum number of indicator points.

Research can be divided into several main groups:

- Biological modeling in plants;
- Digital methods finding applications in physics and chemistry;
- Software programs and computer simulations of catastrophes;
- Other directions.

The main scientific and scientific-applied contributions of Ch. Assist. Stancho Valkanov Pavlov are in the field of mechanics and materials science.

In the first group, the conducted analyzes show the possibility of applying artificial intelligence methods in eco-physiological studies. A rapid tool is provided that contributes to the knowledge needed to develop strategies that would help reduce the impact of environmental stress in agriculture and forestry.

In the second group, the scientific and scientific-applied contributions are:



- The porous structure of carbonized materials from agricultural activity was studied;
- A computer model of an electric field generated by stationary charges was developed;
- An analysis of the behavior of dynamic risk technical systems was performed;
- A method for atomic absorption analysis that does not need a light source has been developed. A computer program for statistical processing and presentation of the results was prepared;
- A method for molecular absorption analysis in the visible spectrum, in which monochromatic light is not needed to measure absorption was developed;
- An optical method for quantitative analysis of sediment concentration based on digital image analysis was developed.

In the third group, the scientific and scientific-applied contributions are:

- The variety of "catastrophes" has been studied in a mathematical and informational aspect;
- An addition was made to Henry Whitney's topology in the sense of investigating the stability of functions from the point of view of group theory;
- The mathematical concept of "infinitesimal stability" was analyzed from the point of view of de Maser's algorithm;
- The potential mathematical function in the practical theory of catastrophes was analyzed;
- Information-mathematical models of Euler rod buckling and arch cracking were created;
- The change of the type of resistance of the dynamic risk systems was studied;
- The sensitivity to imperfection of a composite mechanical system was investigated;
- A mathematical approach for engineering optimization was created;
- A mechano-mathematical model of support brackets has been synthesized.

Ch. Assist. PhD Stancho Valkanov Pavlov is a scientist with interests in various fields.

The most impressive of them are:

- Development of science and education;
- Interaction with other cultures;
- General religion;
- Common language;
- Maintaining military strength, etc.

### **Evaluation of the presented works**

The scientific and scientific-applied works of the candidate fully correspond to the scientific specialty announced in the competition. Ch. Assist. PhD Stancho Vulkanov Pavlov has submitted more materials than are required for the academic position "Associate Professor". According to the declaration of number of points in direction 4.5 Mathematics, Ch. Assist. PhD Stancho Vulkanov Pavlov meets the minimum national requirements with a calculated score of 792 points. By correcting the mistakes he made according to indicator D, i.e. the articles that are in D7 and others have to be indexed with 6 points each, and not with 4 points as the candidate indexed them, Ch. Assist. PhD Stancho Pavlov meets the requirements of the Regulations of the University "Prof. Asen Zlatarov", Burgas for Associate Professor.

### **Notes and recommendations**

Some critical recommendations and remarks could be addressed to the presented documents of Stancho Pavlov.

- Tender documents are not properly organized;
- Errors are noticed in the indexing of individual publications and citations, etc.

The remarks made do not diminish the value of the developments.

### **Conclusion**

Based on the acquaintance with the presented scientific works, their importance, the scientific-applied and applied contributions contained in them, I find it reasonable to propose Ch. Assist. PhD Stancho Vulkanov Pavlov to take the academic position "Associate Professor" in Professional Field 4.5 "Mathematics" (Higher Mathematics) at the department "Mathematics and Physics" at the University "Prof. Asen Zlatarov", Burgas.

Date: 10.11.2022

Signature:

(Corr. member of BAS, Prof. D.Sc. Nikolai Nikolov)