

## OPINION

**Concerning: Competition for the Academic Position "Associate Professor",  
Professional Field 4.5 "Mathematics (Mathematical modelling and applications  
in robotics and mechatronic)  
for the needs of Faculty of Mathematics and Informatics (FMI),  
Sofia university "St. Kliment Ohridski".  
The competition is announced in the State Gazette, issue 20 of March 8, 2024 and  
websites of FMI and Sofia university "St. Kliment Ohridski".**

This opinion was prepared by Assoc. Prof. Dr. Maya Danailova Mikrenska, Department of Mathematics, Faculty of Applied Informatics and Statistics, UNWE, PF 4.5 Mathematics (Mathematical Modelling and Application of Mathematics), as a member of the scientific jury of the competition according to the Order No. RD-38-204/30.04.2024 (modified by the Order No. RD-38-275/03.06.2024) of the Rector of Sofia University.

For participation in the announced competition has submitted documents the only candidate Assoc. Dr. Dimitar Nedanovski, Faculty of Mathematics and Informatics, Sofia University "St. Kliment Ohridski".

### **I. General description of the submitted materials**

#### **1. Application Details**

The documents submitted by the candidate in the competition comply with the requirements of the Law for the Development of Academic Staff in the Republic of Bulgaria and the Regulations for its Implementation, and The Regulations on the Conditions and Procedure for Acquisition of Scientific Degrees and Occupation of Academic Positions at Sofia University "St. Kliment Ohridski".

Chief assistant Dr. Dimitar Nedanovski has submitted a total list of 14 publications, 9 of which he participated in the competition. Seven of the publications submitted for the competition are in prestigious scientific journals with high impact factor (1-Q1, 1-Q2, 3-Q3) and 2 are in conference proceedings, refereed in Scopus and WoS (One of them is with SJR). A list of 31 citations, a reference for fulfilling the minimum national requirements for PD 4.5 and the additional requirements of the St. Kliment Ohridski", reference for original scientific contributions, reference for participation in research projects. Copies of Bachelor's, Master's and PhD diplomas, as well as 5 other documents (in the form of employer's notes and certificates, references and reviews, and other relevant evidence) supporting the candidate's achievements are provided.

I accept for review all 9 scientific articles submitted by the candidate, as they have been published after holding the academic position of " Chief assistant ".

## **2. Details of the applicant**

Chief assistant Dr. Dimitar Nedanovski graduated from the Faculty of Physics, Sofia University "St. Kliment Ohridski" with an impressive average grade in his studies (Excellent 5.98) and obtained his Bachelor's degree in Physics in 2007. In 2009, he graduated from the Master's program "Mathematics and Mathematical Physics" with an excellent grade 6.0 and obtained a Master's degree in Mathematics at the Faculty of Mathematics and Informatics (FMI) of Sofia University "St. Kliment Kliment". She graduated from the Faculty of Mathematics and Physics of the University of St. Kliment Ohridski. In 2016 she successfully defended her thesis on "Superconformal vertex algebras in four-dimensional space-time" and obtained her PhD in Physical Sciences (Theoretical and Mathematical Physics) at the Institute of Nuclear Research and Nuclear Power Engineering, BAS.

Since 2009 he has been working as a physicist at the Laboratory of Elementary Particle Theory of the Institute for Nuclear Research and Nuclear Energy, BAS. From 2017 to 2019 he was an assistant professor and since 2019 he has been a senior assistant professor in PH 4.5 Mathematics at the Department of Mechanics, Robotics and Mechatronics of the Faculty of Physics, Sofia University. He is a professor at the University of Sofia, Sofia, Sofia. In 2014-2015, he was a researcher at the Department of Mathematics, University of Geneva, under the Sciex NMSch program, project "Renormalization, Supersymmetry and Integrability". He is the leader of the research project DFNP-44 under the program for support of young scientists at BAS on "Renormalizations and Residues of Feynman Amplitudes" , participates in the team of the project DN 18/3 on "Algebraic Methods in Quantum Field Theory and Quantum Informatics" at the Research Fund, participates as an expert and trainer in the project BG QCI "Bulgarian National Infrastructure for Quantum Communication".

## **3. General description of the candidate's scientific works and achievements**

The candidate's publications are devoted to topical and significant problems in the field of mathematical modeling and optimization of oil refining processes (publications group A: 1, 3, 4, 5, 6 from the list 10B.SelectedPublicationsList), mechanics and control of a walking robot - (publications group B: 2, 8, 9) and renormalization in quantum field theory (7). Group A publications have developed models using various distributions (Weibull, Weibull extreme, Gamma, Beta distributions, etc.) that approximate the dependencies of certain quantities in real refinery processes reasonably well. The publications of group B are devoted to the development of an innovative walking robot with a minimalist design. In Publication 7, a recursive procedure for analytical renormalization in the coordinate space of a general Feynman amplitude is proposed. The scientific publications submitted by the candidate for the competition exceed the minimum national requirements for the academic position of Associate Professor. The candidate demonstrates high publication activity and a high number of citations in publications with impact factor and SJR. There is no evidence of plagiarism in the scientific works submitted to the competition.

### **3. Characteristics and evaluation of the candidate's teaching activity**

The candidate has the necessary teaching and learning activities related to the professional field of the competition. He has given lectures on the courses "Applied Mathematics 2" (5 academic years) and "Applied Mathematics 4" (2020/2021) to students of the Faculty of Physics of Sofia University. Students of Physics and Mathematics at the University of Physics, Sofia. Chief assistant Dr. Dimitar Nedanovski has been teaching; "Analytical Mechanics" with students of the Faculty of Physics; "Mathematics" with students of the Faculty of Biology since 2017; "Applied Mathematics 3" with students of the Faculty of Physics since 2019.

### **4. Съдържателен анализ на научните и научноприложните постижения на кандидата съдържащи се в материалите за участие в конкурса**

The main scientific and applied contributions of the candidate are in the professional field 4.5. Mathematics and in particular relate to the application of mathematical modelling in robotics and mechatronics. The reference of original scientific contributions presented by the candidate describes them correctly, sufficiently complete, clear and specific. I accept and evaluate as significant and valuable all the scientific contributions mentioned in the author's reference. I evaluate them as new knowledge in an existing scientific field, obtained in the form of theoretical conclusions, models and algorithms, which provide original new solutions and provide new opportunities for practical applications in robotics, oil refining industry, etc. The numerical values (Cumulative IF of journals in which the candidate has published is more than 20. The citations in Scopus/WoS are 31.) are an additional argument for accepting the high scientific value of the research conducted and the results obtained. I accept as equivalent the contribution of Dr. Nedanovski in co-authored publications. I believe that the nature of the problems investigated is such that it implies collective research and, accordingly, publication of the results in co-authorship.

### **5. Critical comments and recommendations**

I have no critical comments and recommendations.

### **6. Personal impressions of the candidate**

I do not know the candidate personally. However, I consider it necessary to share the extremely pleasant impression of the results of his research work. Undoubtedly, prof. Dr. Dimitar Trayko Nedanovski is not only an established but also a very promising scientist.

### **7. Conclusion on the application**

Having read the materials and scientific works submitted in the competition and on the basis of the analysis of their significance and the scientific and applied contributions contained therein, I **confidently confirm** that the scientific achievements of the candidate meet the requirements of the Law for the Development of Academic Staff in the Republic of Bulgaria and the Regulations for its

Implementation, and the relevant Regulations of Sofia University “St. Kliment Ohridski” for the candidate to hold the academic position of "Associate Professor" in the scientific field and professional field of the competition. In particular, the candidate satisfies the minimum national requirements in the professional field and no plagiarism has been found in the scientific works submitted for the competition.

I give my **favourable** opinion of the application.

## II. GENERAL CONCLUSION

On the basis of the above, I recommend the Scientific Jury to propose to the competent authority for the selection of the Faculty of Mathematics and Informatics at the Sofia University “St. Kliment Ohridski” to elect Dimitar Trayko Nedanovski to the academic position of Associate Professor in the professional field 4.5 Mathematics (Mathematical modelling and applications in robotics and mechatronics).

28.06. 2024 г.

Drafted the opinion: .....

Assoc. Prof. Dr. Maya Mikrenska