

## R E P O R T

**on competition for an academic position "associate professor" in professional direction 4.1. Physical Sciences (General Theory of Relativity and Relativistic Astrophysics) for the needs of Sofia University "St. Kliment Ohridski" (SU), Faculty of Physics (FzF), announced in SG no. 30/15/04/2022 and on the websites of FzF and SU**

The review was prepared by: the **Corresponding member of BAS Valentina Borissova Petkova**, in her capacity as a member of the scientific jury for the competition in professional direction 4.1. Physical sciences (General theory of relativity and relativistic astrophysics) according to Order No. RD-38-260/27.05.2022. of the Rector of Sofia University.

Only one candidate submitted documents for participation in the announced competition: Chief Assistant Dr. Kalin Vilianov Staykov, FzF of SU

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

#### **1. Application details**

The documents submitted by the candidate in the competition correspond to the requirements of the ZRASRB, PPZRASRB and the Regulations for the terms and conditions for acquiring scientific degrees and occupying academic positions at SU "St. Kliment Ohridski" (PURPNSZADSU).

For participation in the competition candidate Kalin Vilyanov Staykov has presented a list of **13** publications in foreign scientific publications with Impact Factor (**11 - Q1, 1-Q2, 1 - Q3**), as well as 5 other publications. Various documents (in the form of official notes and certificates from an employer, project manager, financing organization or project sponsor, references and Reviews, Awards and other appropriate evidence) supporting the achievements of the applicant are also presented.

#### **2. Applicant data**

The candidate was born in March 1990. He received his bachelor's degree in 2013., master's in 2014., both - in the Faculty of Physics of Sofia University "St. Kliment Ohridski". His PhD thesis, defended in 2016, was awarded the prize for the best doctoral dissertation at the University of Sofia. It is based on 2 publications (numbers 14 and 17 in the general list) that are not included in the list of those submitted for the current application.

Since 2017 he has been a chief assistant at the Faculty of Physics of Sofia University, and for the last competition he has participated with 2 publications (11 and 18 of the general list), which are not included in the list of those submitted for the competition for Associate Professor. During these years he also acted as a teacher and supervisor of students at the Faculty of Physics of Sofia University. He had 3 one-month specializations in Germany.

Dr. Staykov has participated with reports in 5 international conferences. He has reviewed articles in 3 authoritative international journals. He was a project manager at the FNI, as well as a participant in 4 other projects at the Fund. He was a deputy delegate to the management board of COST action CA16214, "The multi-messenger physics and astrophysics of neutron stars (PHAROS)" 2017 – 2021, member of the organizing committee of NewCompStar School 2017 - "Neutron stars: theory, observations and gravitational waves emission", Sofia, Bulgaria, 2017. He is an associate member in LISA Consortium since November 2021.

In 2022 Dr. Staykov received the most prestigious National Award "Pythagoras" for young scientist.

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

The candidate's scientific results are in the field of general relativity and relativistic astrophysics, which meets the specification of the competition. Specifically: study of the properties of compact objects (black holes and neutron stars) in modified theories of gravity; study of quasinormal modalities (gravitational waves) of these objects and study of space-time around them. The results were obtained in cooperation with members of the research group at the Faculty of Physics of Sofia University, led by professor Stoytcho Yazadjiev, Corresponding member of BAS. I confirm that:

a) the scientific works meet the minimum national requirements and, respectively, the additional requirements of Sofia University "St. Kliment Ohridski" for holding the academic position "associate professor" in the scientific field and professional direction of the competition;

(B) the scientific papers submitted by the applicant do not repeat those of previous procedures for acquiring a scientific title and academic position.

C) I am not aware of "plagiarism proven by law in the scientific works submitted to the competition".

### **4. Characteristics and assessment of the candidate's teaching activity**

The candidate as a teacher has 1912 hours, which is significantly more the established minimum hours, according to the requirements of the Faculty of Physics

### **5. Content analysis of the candidate's scientific achievements contained in the materials for participation in the competition**

In the works presented for the competition some objects and phenomena are analyzed in different gravitational theories, extending the general theory of relativity. The results are compared with the corresponding considerations in Einstein's theory. The contributions of the candidate can be characterized as obtaining and proving new facts that enrich existing knowledge, correspond to modern achievements and represent an original contribution to science. A significant part of them were obtained using modern methods of numerical calculations. The results have been published in the most

prestigious journals and have significant impact on the work of other authors. The **13** works presented for the competition have **162** citations, their Hirsch factor is **h=10**, and the average citation rate of all articles co-authored by Kalin Staykov is close to **20** citations per paper.

All publications of the candidate are collective. It is noteworthy that in 7 of them the name of d-r Staykov appears first in the arrangements of the co-authors names not in alphabetical order. According to the official Certificate by the Corresponding member of BAS Stoytcho Yazadjiev, Dr. Kalin Staykov made a significant contribution to the results in 9 of the papers submitted for the competition.

## **6. Critical notes and recommendations**

I have no critical comments.

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

I do not know the candidate personally.

## **8. Conclusion on the application**

After having familiarized myself with the materials and scientific works presented in the competition and based on the analysis of their significance and the scientific and scientific-applied contributions contained in them, **I confirm** that the scientific achievements meet the requirements of ZRASRB, the Regulations for its application and the relevant Regulations of SU "St. Kliment Ohridski" for the candidate to occupy the academic position of "**associate professor**" in the scientific field and professional direction of the competition. In particular, the candidate satisfies the minimum national requirements in the professional direction and no plagiarism has been found in the scientific works submitted for the competition. I give my **positive assessment** to the application.

## **II. GENERAL CONCLUSION**

Based on all above, I strongly recommend the scientific jury to propose to the competent authority for the selection of the Faculty of Physics at SU "St. Kliment Ohridski" to choose **Kalin Vilianov Staykov** to occupy the academic position of "associate professor" in professional direction 4.1. Physical Sciences (General Theory of Relativity and Relativistic Astrophysics) for the needs of the Faculty of Physics at Sofia University "St. Kliment Ohridski".

28.8.2022

Prepared the report:

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