

## Attitude of Reviewer

on competition for the occupation of the academic position "Associate Professor" in the professional field 4.1 "Physical Sciences" (General Physics), for the needs of the Sofia University "St. Kliment Ohridski", Faculty of Physics, announced in SG No. 54 of 29. 06. 2021

Only one applicant participates in the competition: Assistant Professor Dr. Plamen Veskov Petkov, Faculty of Physics at the Sofia University.

This Attitude of Reviewer is prepared by Professor Dr. Peter Metodiev Rafailov, ISSP – BAS, professional field 4.1 "Physical Sciences" (Condensed Matter Physics) as member of the scientific jury on this competition.

I. General description of the materials presented.

1. *Information about the application.* The documents submitted for the competition by the applicant comply with the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria (ADASRB), the Regulations for its Application and the Regulations on the terms and conditions for acquiring scientific degrees and occupation of academic positions at Sofia University "St. Kliment Ohridski" (RTCASDOAPSU).

For participation in the competition Assistant Professor Plamen Petkov has presented a list of a total of 19 titles, representing 7 articles in scientific journals with impact factor, 8 proceedings from conferences, published in full text, 3 book chapters and 1 monograph. A list of citations is also given, and according to the submitted document for compliance with the requirements for the competition, 107 citations are presented. In support of the applicant's achievements, official notes are presented for classroom teaching employment, participation in research projects, documents on extracurricular work with students and PhD students, information on the diploma theses supervised by the applicant, documents for successfully implemented technical solution at Kozloduy Nuclear Power Plant (NPP).

2. *Information about the applicant.* Plamen Petkov has graduated in the engineering speciality "Thermal Physics" at the State Technical University, St. Petersburg, Russia. He has completed specializations in the Argonne National Laboratory on Thermohydraulic Analyses and the University of Illinois, USA in Educational Nuclear Engineering. He used the acquired qualification in his 18-year work at Kozloduy NPP, starting from a reactor engineer and eventually becoming head of the Thermohydraulic Analysis Group.

During the period 2007-2011 Mr. Petkov acquired a second master's degree on "Colloidal systems in modern science and technology" at Sofia University (SU) "St. Kliment Ohridski" and since 2010 he has been working there as a chemist-analyst in the field of colloid chemistry. In 2016 he acquired the PhD degree at the Faculty of Chemistry and Pharmacy, and since 2017 he has been working as Assistant Professor at the Faculty of Physics at SU "St. Kliment Ohridski".

3. *General characteristics of the scientific publications and the achievements of the applicant.* The PhD thesis of Mr. Petkov is based on three articles in quartile Q1. Those works together with a fourth publication used for occupation of the position

Assistant Professor are not included in the publications submitted for the present competition.

Dr. Petkov presents himself in this competition with 19 publications, of which 3 articles in quartile Q1 and 3 articles with SJR form his habilitation work and yield 105 points in indicator group V. The remaining 13 papers (of which 3 in quartile Q2, 1 in quartile Q3, 5 articles with SJR, one collective monograph and 3 book chapters) have been submitted as "scientific publications beyond the habilitation work" in accordance with the provisions of the ADASRB and the Regulations for its Application and yield 200 points in indicator group G. The applicant has submitted for the competition 107 of his independent citations, which not only meets the national criteria for indicator D, but also satisfies the increased citation criteria of the Faculty of Physics at Sofia University. The applicant's h-index is 5. It is noteworthy that in only one publication there is no evidence of a significant contribution of the applicant, and in 5 of them (including one book chapter) he is the sole author. It would not be an exaggeration to say that Dr. Petkov's participation in most of the presented publications was decisive for their realization. Article №8 is in quartile Q1 and was published in 2020.

The presented assets yield 305 points in total in indicator groups V and G, and 214 points in indicator group D of the Regulations for Application of the ADASRB, which fully satisfies the minimum national requirements as well as the additional requirements of the Faculty of Physics at SU for occupation of the position "Associate Professor". There is no legally proven plagiarism in the scientific papers submitted for the competition and no indications for such are found. The high level of research described in the submitted articles is emphasized by the acceptance and publication of some of them in prestigious journals with high impact factors such as Nuclear Science and Engineering, Nuclear Engineering and Design, Colloids and Surfaces A as well as their multiple citing in international journals. Dr. Petkov's research interests represent an interesting combination of fields: on the one hand, modeling of processes in the operation of nuclear reactors and on the other: research in the field of colloid chemistry, and his active work in both fields continues to the present day.

4. *Characteristics and evaluation of the educational activity of the applicant.* The applicant has presented evidence for classroom teaching employment of 885 hours and total educational employment of 1244 hours, which significantly exceeds the required teaching experience, equivalent to 2 years of full classroom employment at Sofia University according to Art. 105. (1) from RTCASDOAPSU.

During his work as Assistant Professor, Dr. Petkov has supervised four successfully defended diploma theses. Also very valuable is the extracurricular work of Dr. Petkov with students and PhD students, e.g. the preparation of two teams and moderation of the international HackAtom competition.

5. *Analysis of the scientific and the scientific-applied achievements of the applicant.* Among the applicant's most significant contributions I would point out the following:

- Successful application of statistical methods for estimation of parameters important for the normal operation of nuclear reactors and the safe storage of nuclear fuel;
- Modeling of operation regimes of an innovative small modular fast neutron reactor with derivation of a concept for optimization of nuclear power management of this type;

- Theoretical and experimental study of capillary bridges between two flat surfaces with determination of the changes in their parameters under external influences;

- Contributions to the study of the surface properties and interactions of monolayers of particles located at the liquid / gas interface.

I support all contributions presented by Dr. Petkov. They indicate the applicant's unique talent for combining basic and applied research. The scientific contributions presented can be characterized as *enrichment of existing knowledge and theories with new facts and application of scientific achievements in practice*.

The number of research projects with the participation of the applicant is 9, 6 of which are international and funded by the company Unilever - an example of successful interaction of science with industry. The applicant was also head of the research team of one of the remaining three national projects. The presented documents show high expert knowledge and accuracy in the work of Dr. Petkov on the implementation of the projects. The scientific and scientific-applied activity of the candidate characterizes him as a perspective scientist, capable of planning and leading scientific research.

6. *Critical remarks and recommendations*. I see no reason for critical remarks and recommendations to the applicant's works.

7. *Personal impressions from the applicant*. I do not know the applicant personally, but I know from conversations with colleagues that he puts a lot of enthusiasm in his teaching and especially in the online training conducted by the Department of General Physics in the last 2 years.

8. *Conclusion on the application*. After getting acquainted with the materials and scientific works presented for the competition and on the basis of the analysis of their significance and the scientific and scientific-applied contributions contained in them, **I confirm** that the scientific achievements of the applicant Dr. Plamen Petkov meet the requirements of ADASRB, The Regulations for its application and the respective Regulations of Sofia University "St. Kliment Ohridski "(RTCASDOAPSU) for the occupation of the academic position "Associate Professor "in the scientific and professional field of the competition nu the applicant. In particular, the applicant satisfies the minimum national requirements in the professional field and no plagiarism has been established in the scientific papers submitted at the competition. With his scientific and teaching experience, Dr. Petkov would be very valuable as a habilitated lecturer in the Department of General Physics at the Faculty of Physics at Sofia University.

I give a **positive** assessment of the application.

## II. GENERAL CONCLUSION

Based on the above, **I recommend** the scientific jury to propose to the Faculty Council of the Faculty of Physics at Sofia University "St. Kliment Ohridski" to elect Assistant Professor Dr. Plamen Veskov Petkov for the academic position of "Associate Professor" in the professional field 4.1 Physical Sciences (General Physics).

Sofia, 05. 11. 2021

Jury member: /signed/  
Professor Dr. Peter Rafailov