

REFEREE STATEMENT

**Call for academic position "Associate professor"
Scientific strand: 4.1 Physics Sciences (General Physics)
Faculty of Physics, University of Sofia "St. Kliment Ohridski"
announced in State Gazette no. 54 of 29/06/2021**

This statement is prepared by Assoc. Prof. Dr. Kalin Angelov Gladnishki, Faculty of Physics, University of Sofia, as a member of the scientific jury for selection of an Associate professor in 4.1. Physics Sciences (General Physics) according to Document No. PД38-374 /21.07.2021 of the Rector of University of Sofia.

Single candidate has submitted documents to participate in the announced call

Head Assistant Prof. Dr. Plamen Veskov Petkov, Faculty of Physics at University of Sofia.

I. General description of the submitted materials

1. Application Details

For participation in the competition, the candidate Plamen Veskov Petkov has submitted a list of 20 publications, all of which are published in international peer-reviewed and indexed journals with an impact factor. Three of them are publications in journals with quartile Q1 and three in issues with quartile Q2. One of the titles presented is a chapter in a book.

The submitted by the applicant documents comply with the Bulgarian national requirements and the Rules on the conditions and procedure for acquiring science degrees and holding academic positions in University of Sofia "St. Kliment Ohridski" (PURPNSZADU).

2. Candidate Details

In 1992, Plamen Veskov Petkov graduated the Leningrad State Technical University (St. Petersburg, Russia) and obtained a master's degree - engineer physicist in the field of Thermophysics.

In 2000-2001, the candidate specialized in a program of the International Atomic Energy Agency (IAEA) related to thermohydraulic analyzes with the MELCOR program at the Argonne National Laboratory, USA.

In the period 2001-2003, he participated in the program "Educational Nuclear Engineering" at the University of Illinois, Urbana-Champaign, USA (University of Illinois, Urbana-Champaign, USA) (without obtaining any scientific degree).

The next step in the Plamen Petkov's education is the acquisition of the "Master" degree in the specialty "Colloidal Systems in Modern Science and Technology" at University of Sofia "St. Kliment Ohridski".

In 2016, Plamen Petkov successfully defended dissertation for his PhD degree in the specialty Theoretical Chemistry, "Macrokinetics" from University of Sofia "St. Kliment Ohridski".

The career development of Head Assist. Professor Plamen Petkov is as follows: From 1992 until 2010, Dr. Petkov worked in various positions (from senior operator of VVER-440 reactor to head of the Thermohydraulic Analysis Group) at Kozloduy NPP.

In the period 2010 - 2016, the candidate worked as a chemist-analyst at the Faculty of Chemistry and Pharmacy at University of Sofia "St. Kliment Ohridski".

In 2017, he occupied the position of Head Assistant Professor at the Department of Nuclear Engineering and Energy, at University of Sofia "St. Kliment Ohridski", a position holds to this day.

3. Characteristics and analysis of the candidate's scientific works and achievements

The scientific interests of Dr. Plamen Petkov cover many different fields. A total of 20 publications were submitted for the competition, including one chapter in a book, six in journals with Q1 and Q2, four were published in journals of group two (Q3 and Q4), and the rest in editions with SJR without IF.

3.1) Comparison of the applicant's indicators with the requirements for occupation of the academic position Associate Professor

a) P. Petkov meets the minimum national requirements (aka points) for occupying the academic position of associate professor, adopted by the "Rules for the Implementation of the Law for the Development of Academic Staff in the Republic of Bulgaria" (PPZRASRB) on 19.02.2019.

Group A, Indicator 1, min. 50 points, scored 50 pts

Group B, Indicator 3 or 4, min. 100 points, scored 105 pts (from Ind. 4)

Group Г, Indicators 5-10, min. 200 points, scored 200 pts (from Ind. 7 and Ind. 8)

Group Д, Indicator 11, min 50 points, scored 214 pts

b) P. Petkov's indicators meet the Additional requirements of the Faculty of Physics of the University of Sofia, adopted on 29.01.2020

Requirements	Applicant's indicators
- minimum 7 publications in Group I	6 publications*
- at least 1 publ. in the last 3 years	3 in the last 3 years
- substantial contribution in at least 4 of the group I publications	6 articles
-minimum 50 independent citations in peer review journals	132
- h-index of at least 5	5
- scientific guidance of at least 1 successfully defended (under)graduate	4
- guidance and/or participation in international and/or national projects.	Yes**

* - The candidate has submitted 6 publications in Group I instead of the required 7. Taking into account the fact that the requirements on some of the other criteria have been exceeded (eg 6 publications with significant contribution instead of required 4 and 132 independent citations instead of the required 50), it can be assumed that the candidate meets the additional requirements.

** - Specializations abroad for terms longer than 4 months (cumulative).

3.2) Scientific Research

Dr. Petkov's research activities can be divided into four main groups depending on the direction of the research included in them:

1) Study of the uncertainty of measurements and calculations in the field of nuclear energy.

The candidate's contributions on this topic are related to the development of a system for collecting data from measuring devices of nuclear facilities and the introduction of innovative methods in their processing. A methodology has been developed to assess the transfer of uncertainties in the irradiation of the old fuel on the amount of isotopes obtained and hence on the residual energy release after shutdown of the reactor.

2) Publications related to the design and study of the safety functions of an innovative small modular fast neutron reactor (STAR-LM project).

In the scientific papers related to this topic, a concept has been proposed, which justifies the possibility for the small modular reactor STAR-LM to achieve 100% natural circulation operation. It has been shown that this approach to heat removal from the core can be economically justified, this concept makes it possible to optimize the management strategies of nuclear power plants of this type.

3) Theoretical and experimental study of capillary bridges between two flat surfaces.

As a result of the conducted researches, a definite area of existence of the liquid capillary bridges has been defined and substantiated.

4) Investigation of the surface properties of monolayers of particles located at the liquid / gas interface.

Some of the contributions on this topic are related to the development of a theoretical model that takes into account the multiparticle interactions in the monolayer and gives an analytical formula for the dependence $1 / (L)$. It has been found experimentally that the appearance of aggregates in the monolayer of charged particles leads to an increase in the two-dimensional pressure, and it has been theoretically shown that the two-dimensional pressure increases linearly with the square root of the aggregation number.

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

Throughout the years as a lecturer, the candidate has had a full academic workload, leading a wide range of compulsory and optional courses (lectures and seminars). The courses which he has been teaching are oriented for both bachelor and master students at the Faculty of Physics at University of Sofia. The scientific guidance of Head Assistant Professor Petkov includes successful defense of four diploma theses.

5. Conclusion of the application

After reviewing the materials and scientific works presented and on the basis of the analysis of their importance and the scientific and applied contributions contained therein, I confirm that the scientific achievements meet the Bulgarian national requirements, and the corresponding Rules of University of Sofia "St. Kliment Ohridski" for holding of the academic position of Associate Professor. In particular, the applicant meets all the minimum national requirements in the professional field and no plagiarism has been detected in the scientific papers submitted for the competition.

I definitely give my positive assessment of the application.

II. GENERAL CONCLUSION

On the basis of the mentioned above, I strongly recommend the Scientific Jury to propose to the Faculty Council of the Faculty of Physics, University of Sofia "St. Kliment Ohridski" to elect Assist. Prof. Dr. Plamen Veskov Petkov for the academic position of Associate Professor in the professional strand 4.1 Physics Sciences (General Physics).

03.11.2021 г.
Sofia

Statement prepared by.....
(Assoc. Prof. Dr. Kalin Gladnishki)