

OPINION

**on a competition for academic credibility „Associate Professor“
in the professional field 4.1. Physical Sciences,
for the needs of Sofia University ”St. Kliment Ohridski”, Faculty of Physics,
announced in the State Newspaper, issue 57/26.06.2020**

Opinion prepared by:

Nedialka Ilieva Stoilova, Assoc. Prof., Dr.Sci., Institute for Nuclear Research and Nuclear Energy, Bulgarian Academy of Sciences as a member of the scientific jury of the competition: 4.1. Physical Sciences (Theoretical and Mathematical Physics) according to Order № RD 38-323/21.07.2020 of the Rector of Sofia University.

Only one candidate has submitted documents for participation in the announced competition: Kiril Petrov Hristov, Assis. Prof., Ph.D., Lab. “Theory of Elementary Particles”, Institute for Nuclear Research and Nuclear Energy, Bulgarian Academy of Sciences.

I. General description of the submitted documents

1. Details of the application

All submitted documents by the applicant comply with the requirements of ZRASRB, PPRASPB and the Regulations on the conditions and procedure for acquiring academic degrees and occupying academic positions at Sofia University ”St. Kliment Ohridski” (PURPNSZADU).

The candidate Kiril Petrov Hristov has presented a list of 33 scientific publications, 30 of them published in the most prestigious international scientific journals (JHEP, Phys. Rev. D, Phys. Rev. B, Nucl. Phys. B, Fortsch. Phys., J. Phys. B), 1 Ph.D. thesis (in the arXiv) and 2 preprints in the arXiv. Kiril Hristov participates in the competition with 22 out of his 33 papers. Other documents (certificates, diplomas, etc.) in support of the candidate’s achievements were also presented.

I have no additional remarks and comments.

2. Details of the applicant

Kiril Hristov earned his Bachelor of Science in Physics (2003-2006) at Jacobs University Bremen in Germany and Master degree in Theoretical Physics (2006-2008) at Utrecht University, Netherlands. In September 2008 he continued his education in Theoretical Physics at Utrecht University as a Ph.D. student. Kiril Hristov defended a Ph.D. thesis in 2012 and specialized as a postdoc (2012-2015) at the University of Milano-Bicocca. In 2015 he became a member of the Laboratory “Theory of Elementary Particles”, of the Institute for Nuclear Research and Nuclear Energy, Bulgarian Academy of Sciences.

3. General characteristics of the applicant’s scientific work and achievements

Kiril Hristov's scientific results are in the most current fields of theoretical and mathematical physics. He has published and continues to publish on important issues in the field of quantum field theory, general relativity, quantum gravity, supersymmetry, string theory, high energy physics, conformal field theory, M-theory. Analyzing the materials presented in the competition, I confidently declare:

- the scientific publications submitted by the candidate meet the minimum national requirements (Art. 2b, paragraphs 2 and 3 of ZRARB) and also the additional requirements of Sofia University “St. Kliment Ohridski” for the academic position “Associate Professor” in the scientific field and professional direction of the competition.
- the scientific publications of the candidate in the competition do not repeat any paper of previous procedures for acquisition of a scientific title and academic position.
- there is no proven plagiarism in the scientific publications of the candidate.

4. Characterization and evaluation of the applicant’s teaching activity

Kiril Hristov has taught the following courses as a teaching assistance: General Physics, Classical Mechanics and Special Relativity, Quantum Mechanics (at Jacobs University Bremen) and Quantum Field Theory, Advanced Field Theory in Particle Physics, General Relativity and Statistical Field Theory (at Utrecht University). Since 2016 he has given the lecture courses Quantum Field Theory and Advanced Quantum Field Theory at Sofia University. Altogether Dr. Hristov has 1500 academic lessons. He has supervised (partially) one successfully defended PhD thesis.

5. Substantive analysis of the scientific and applied scientific achievements of the candidate contained in the materials for participation in the competition

Without giving a detailed description of the scientific achievements of Dr. Hristov, which represent the development of new theories, methods and enrichment of existing knowledge, I would like to emphasize the following results: BPS black hole solutions in gauged $N = 2$ $D = 4$ supergravity with charged hypermultiplets are constructed and analyzed; the consequences of the spherical symmetry in $N = 2$ gauged supergravity in the presence of Fayet-Iliopoulos terms for certain static supersymmetric AdS4 black holes were studied; the thermodynamic properties of a class of spherically symmetric and static black holes in AdS4 with magnetic charges and scalar hair were determined; new static solutions have been found in different sectors of 5d $N = 8$ supergravity with compact and non-compact gauged R-symmetry groups; BPS black hole attractors in 4d gauged supergravity in the presence of higher derivative supersymmetric terms, including a Weyl-squared-type action, are analyzed, and the resulting corrections to the Bekenstein-Hawking entropy are determined; it is shown that the entropy of BPS, rotating, electrically charged AdS5xS5 and AdS7xS4 black holes can be obtained by an extremization principle; new analytic rotating AdS4 black holes are proposed as solutions of gauged $N = 2$ supergravity coupled to Abelian vector multiplets with a symmetric scalar manifold.

Dr. Hristov provided 132 independent citations of papers 11-22 from the "List of publications submitted for participation in the competition". The candidate has an h-factor 18, following the competition documents. To the best of my knowledge, the candidate has significant contributions to the collective publications.

6. Critical notes and recommendations

I have no critical notes and recommendations.

7. Personal impressions

I have known Kiril Hristov since 2015 as the most active erudite young scientist, member of the Laboratory "Theory of Elementary Particles" at the Institute for Nuclear Research and Nuclear Energy, BAS. I have excellent impressions of the competencies demonstrated by the candidate in the talks presented by him at the seminars of the Laboratory, as well as his active participation during the seminars of other scientists.

8. Conclusion on the application

After getting acquainted with the materials and scientific works presented in the competition and based on the analysis of their importance and the scientific contributions, I confirm that the scientific achievements meet the requirements of ZRASRB, the Regulations for its implementation and the corresponding Regulations of Sofia University "St. Kliment Ohridski" for holding the candidate for the academic position "Associate Professor" in the scientific field and professional direction of the competition. In particular, the applicant exceeds the minimum national requirements in the professional field. No plagiarism was found in the scientific papers submitted for the competition.

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

II. OVERALL 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 Dr. Kiril Petrov Hristov to take the academic position of "**Associate Professor**" in the professional field 4.1. Physical sciences (Theoretical and mathematical physics).

29.09.2020

Signature:

(Assoc. Prof. Nedialka Stoilova, Dr.Sci.)