

REPORT

**on a competition for academic position “Associate Professor”
in professional field 4.1. Physical science (Theoretical and mathematical physics),
for the needs of Sofia University “St. Kliment Ohridski” (SU), Faculty of Physics (FPh),
announced in SG, issue 57/ 26.06.2020 and on the Website of FPh and SU**

This report is prepared by Prof. Dr. Sci. Stefan Petrov Ivanov from the Faculty of Mathematics and Informatics at the Sofia University “St. Kliment Ohridski” professional field 4.5. Mathematics (Differential Geometry), as a member of the Scientific Jury on this procedure according to Order № ПД 38-323 / 21.07.2020 of the Rector of the Sofia University “St. Kliment Ohridski”.

Only one applicant has submitted documents for participation in the announced competition: Assistant Professor PhD Kiril Petrov Hristov, INRNE-BAS.

I. General description of the presented documents

1. Information about the documentation

The documents presented by the applicant for the competition satisfy the requirements of the Act on Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its application, and the Rules for the conditions and regulations for acquiring scientific degrees and occupying academic positions in the Sofia University “St. Kliment Ohridski”.

For participation in the competition, the applicant Kiril Petrov Hristov has presented a list of 22 scientific papers, all of them being publications in the most prestigious scientific journals with high impact factor. A list of the applicant's citations is also presented, as well as 16 other required documents (official notes, certificates for working experience, references for participation in projects and other relevant evidence), supporting the applicant's achievements.

2. Information for the applicant.

The applicant Kiril Hristov was born in 30.03.1985 Sofia, Bulgaria, graduated with a Bachelor's degree in physics in 2006 from the International University, Bremen, Germany and a Master's degree in 2008 in Theoretical Physics from the Utrecht University, Netherlands. In 2012 he defended the PhD thesis “Lessons from the vacuum structure of D=4 N=2 Supergravity” under the supervision of the well known physicist Stefan Vandoren thus obtaining doctor degree in Theoretical Physics from the Utrecht University, Netherland. In the period 2012-2015 he is a research assistant in the Theoretical Physics group at the University of Milano-Bicocca, Italy and from 2015 he held a position as an assistant professor in the research group “Theory of elementary particles” at the INRNE-BAS, Sofia, Bulgaria where he currently works.

3. General characteristic of the scientific work and achievements of the applicant.

The research interests of d-r Hristov are mainly in the field of supersymmetric string theories, black holes and supergravity - the most important and promising physical theories now days with final goal to create a model which may unifies fundamental forces in the Nature. In the last years the investigations of the applicant are focused on different aspects of supersymmetric black holes, supersymmetric solutions of gauged supergravity, supersymmetric string theories of typeA and typeB. It needs to mention the fact that some of the most famous physicists and mathematicians in the world e.g. the Nobel prize winners G.'t Hooft, S. Weinberg, A. Salam, the fields medal winners S.-T. Yau, E. Witten etc. were working and work in this field. In my opinion the branches of physics and mathematics where d-r Hristov is working are the most important and promising parts of physics and mathematics in the world.

For the participation in the competition, the applicant d-r Hristov has presented 22 scientific papers, 18 of them are published in JHEP, 3 of them are in Phys. Rev. D and 1 is published in Nucl. Phys. B. The applicant claimed essential participation in 20 of his joint publications.

Twelve (11-22) of the presented scientific publications submitted for the competition have not been used in previous applications for acquiring a scientific degree or occupying an academic position.

No plagiarism has been established in the scientific papers submitted for the competition.

By no doubt the presented scientific publications (11-22) meet in advance the minimal national requirements of the Act on Development of the Academic Staff in the Republic of Bulgaria as well as the additional requirements of the Sofia University "St. Kliment Ohridski", Faculty of Physics for occupying the academic position "Associate Professor" in the scientific field and professional field of the competition.

4. Characteristic and evaluation of the teaching activities of the applicant.

The applicant Kiril Hristov has a rich teaching activity: 360 hours in Germany, 600 hours in Niderland and 540 hours in Bulgaria which meets in advance the minimal requirments of 540 hours.

5. Analysis of the scientific and scientific-applied achievements of the applicant contained in the documents and publications presented for the competition.

In my opinion the scientific achievements of d-r Hristov in the theory of supersymmetric strings, the black holes and supergravity by no doubt are quite remarkable. It is sufficient to be mention that it is discovered a new family of a product of a 2-dimensional anti-de Sitter and a 4-dimensional space (AdS₂xM₄) supersymmetric solutions of the 6-dimensional gauged supergravity coupled to one vector multiplet arising as a low energy description of massive type IIA supergravity on the product of 6-dimensional anti-de Sitter and the 4-dimensional sphere (AdS₆xS₄). It is shown that the 4-dimensional space M₄ is either a Kaehler-Einstein or a product of two Riemann surfaces with constant curvature metric. It is also found an explicit supergravity background dual to the Omega-deformation of a 4-dimensional N=2 superconformal field theory on a flat 4-dimensional space and some consequences arising from this explicit solution are analyzed.

The remarkable scientific quality of the work of the applicant Kiril Hristov become clear also from his high numerical parameters: he has presented 12 scientific publications submitted for the competition that have not been used in previous applications for acquiring a scientific degree or occupying an academic position and he has essential participation in 11 of them. Nine of these papers are published in **JHEP** which is the world top journal in high energy physics, 2 are in **Phys. Rev. D** and 1 is published in **Nucl. Phys. B**. The sum of all impact factor of these publications is about 60. He presented 132 citations of these 12 publications and all of his citations are 721 (without self-citations) with h-index = 18. Most of his citations are by foreign authors in renowned scientific journals. His results have been presented at a total of **26** national and international forums, **23** of which are abroad (in Belgium, United Kingdom, Netherlands, Switzerland, Germany, Italy, Brazil, Greece).

For his remarkable scientific work d-r Hristov has awarded several prestigious Prizes and Awards as “Marin Drinov” prize from BAS for excellent young scientist 2019, best scientific paper in BAS for 2017, “Pythagoras” prize for excellent young scientist from the Bulgarian government 2017, Marie Sklodowska-Curie actions seal of excellence etc.

6. Conclusion for the applicant

After my careful and critical reading of the documentation and the publications presented for the competition and my analysis of their significance and the scientific and scientific-applied contributions, **I confirm** that the scientific contributions of **Kiril Petrov Hristov** meet the requirements of the Act on Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its application, and the Rules for the conditions and regulations for acquiring scientific degrees and occupying academic positions in the Sofia University “St. Kliment Ohridski” for occupying the academic position “**Associate Professor**” in the scientific field and the professional field of the competition. In particular, the applicant meets the minimal national requirements in the professional field and no plagiarism has been established in the scientific papers submitted for the competition.

I give my **positive** evaluation for the application.

II. GENERAL CONCLUSION

Based on the above, **I recommend** the Scientific Jury to propose to the Council responsible for the election of the Faculty of Physics at the Sofia University “St. Kliment Ohridski” to elect **Assistant Professor PhD Kiril Petrov Hristov** to occupy the academic position “**Associate Professor**” in the professional field 4.1 Physical Sciences (Theoretical and mathematical physics).

27.09.2020 г.

Referee:

(Prof. Dr.Sci. Stefan Ivanov)