

REPORT
on a competition for the occupation of
an academic position “Associate Professor”
in a professional direction
4.5 Mathematics (Differential Equations),
for the needs of Sofia University “St. Kliment Ohridski”(SU),
Faculty of Mathematics and Informatics (FMI),
announced in SG no. 65/16.08.2019 and on the websites of FMI and SU

The report was prepared by Prof. D.Sc. Stepan Agop Tersian,
Institute of Mathematics and Informatics (IMI), Bulgarian Academy of Sciences (BAS),
as a member of the Academic board for competition on
4.5 Mathematics (Differential Equations),
under Order No. RD 38-593 / 11.10.2019 of the Rector of Sofia University.

The only candidate for the competition is Senior assistant PhD Tsvetan Dimitrov Hristov from the Faculty of Mathematics and Informatics at Sofia University “St. Kliment Ohridski”.

I. General description of the materials presented

For each of the candidates, an information on points 1 to 8 is given:

1. Details of the application

The submitted documents from the applicant correspond to the requirements of the ZRASRB, RAPRRRB and the Regulations on the conditions and procedure for acquiring scientific degrees and occupying academic positions at Sofia University “St. Kliment Ohridski” (PURPNSZADU).

For the participation in the competition the candidate Senior assist. PhD Tsvetan Dimitrov Hristov presented a list of 14 titles, incl. 13 publications in Bulgarian and foreign scientific journals and proceedings of scientific forums, 0 studios, 0 monographs, 0 books, 0 certificates and patents, 1 teaching material. 65 other documents (in the form of job descriptions and certifications from an employer, project manager, financing organization or project sponsor, references and reviews, awards and other relevant evidence) supporting the applicant's achievements were also presented.

2. Details of the applicant

According to the presented CV, Tsvetan Dimitrov Hristov was born in 1974, graduated as a master in Mathematics, specialization Differential Equations at the Faculty of Mathematics and Informatics (FMI) of Sofia University "St. Kliment Ohridski" in 1998. He was a doctoral student at FMI-SU and has defended his doctoral thesis "Singularities of solutions of hyperbolic equations in areas with characteristic boundary" by the specialty 01.01.05 Differential equations in 2006 (Appendix 03). During 1998-2001 he was a mathematician at IMI-BAS, 2005-2007 was assistant at FMI-SU, from 2007 is Senior assistant. He has lectured at FMI-SU in the following subjects: Differential Equations and Applications, Equations of Mathematical Physics, Partial Differential Equations, Selected Topics in Mathematical Analysis, Variational Methods in Mathematical Physics for various specialties at FMI (Appendix 15, Appendix 15.2). He was an advisor of one successfully defended graduate student.

He was the head of the project "Educational applications for computer simulation of real processes", realized within the program for improving the quality and effectiveness of training at FMI - EOS during 2013. SimCoDi application for computer simulation and three-dimensional visualization of real processes was created. (<https://intranet.fmi.uni-sofia.bg/index.php/s/kPONUWk8Yjc1fLw>). These facts illustrate the various teaching activities of Senior assistant Tsvetan Hristov. Lists of 6 participations in scientific projects at the NSF-MES, 16 participations in scientific projects at the NSF-SU, 36 scientific reports are presented (see Annex 15: 5.1, 5.2, 5.3, 6.1).

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

a) The scientific papers of Senior assistant Tsvetan Hristov satisfy the minimum national requirements (under Art. 2b, para 2 and 3 of the ZRASRB) and the additional requirements of Sofia University "St. Kliment Ohridski" for the academic position of Associate professor in the professional field 4.5 Mathematics (Differential Equations) of the competition, as follows:

Group of Indicators	Contents	Minimal points for a.d. Associate Professor	Points
A	Indicator 1	50	50
B	Indicator 2	-	-
C	Indicator 3 or 4	100	111
D	Sum of indicators from 5 to 10	200	312
E	Indicator 11	50	480
F	Sum of indicators from 12 to the end	-	-

According to the group of indicators G, 2 articles in Quartile Q4 ([3] and [11]) and 8 articles with SJR ([4], [5], [7], [8], [9], [10], [12] and [13]) are presented outside of the habilitation work, which bring $3(2 \times 12 + 8 \times 10) = 312$ points to the candidate.

(b) the scientific papers submitted by the applicant do not repeat those of previous procedures for the acquisition of a scientific title and academic position;

c) there is no proven plagiarism in the scientific papers, presented at the competition.

3. Characterization and evaluation of the applicant's teaching activity

Senior assistant Tsvetan Hristov has been a part-time lecturer since 1998, since 2005 an Assistant and after 2007 a Senior assistant at FMI-SU. He has taken classes in compulsory subjects: Differential Equations and Applications, Equations of Mathematical Physics, Partial Differential Equations (PDE), Differential Equations and Applications. He has lectured on Calculus 1 and Calculus 2, Differential Equations, PDE, Selected Chapters in Mathematical Analysis, PDE and Applications, Exercises on Variational Methods in Mathematical Physics (Appendix 15.2). He was an advisor of one successfully defended graduate student. Tsvetan Hristov has a successful teaching experience and he provides the teaching material in an understandable way. He was the head of a project under the ECO program to improve the quality and effectiveness of teaching.

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

The $(3 + 1)$ dimensional boundary value problem for Keldysh type differential equations was studied in the papers [1], [2], [3] and [11]. They are known in applications of mathematical models in plasma physics and optics. A generalized solution with a possible singularity is defined and the results for the existence and uniqueness of such solutions are proved. The asymptotic behavior of the generalized solutions at a singularity point is studied. The degree of the singularity at the beginning of the solutions of boundary value problems for weakly hyperbolic equations of the Proter type is investigated. The three-dimensional Proter boundary value problems for Tricomi-type and Keldysh-type equations have been studied in the papers [4] - [10] and [12]. Sufficient conditions for the existence and uniqueness of the solutions and the correctness of the problems are considered. The results obtained enrich the existing knowledge and have applications in physics.

The paper [13] deals with the electronic assessment of students' knowledge. The possibilities and limitations of student identification are discussed. Experiments with TeSLA was discussed. Of the 13 articles presented, 12 are co-authored and one is self-authored. In the joint publications, I suppose that the authors' contribution is equivalent.

According to the Scopus information system for Tsvetan Hristov (Author ID: 15925284800), 17 articles were referenced with 123 citations in 46 documents, H-index 8 (<https://www.scopus.com/authid/detail.uri?authorId=15925284800>).

According to Web of Science, Tsvetan Hristov has 17 references referenced, H-index 7, 93 citations in 40 articles, H-index 7

(<https://app.webofknowledge.com/author/#!/record/4000866>).

5. Critical notes and recommendations

I have no critical comments on the submitted materials and documents for the competition. They are very well arranged and presented. Spelling mistakes can be corrected in some places (in Appendix 14).

6. Personal impressions of the applicant

I know Senior assistant Tsvetan Hristov from participation in seminars and conference reports. My personal impressions are very good.

7. Conclusion on the application

Under above mentioned on the materials and scientific papers presented to the competition and on the basis of the analysis of their importance and the scientific and applied applications, I confirm that the scientific achievements meet the requirements of the ZRASRB, the rules for its implementation and the rules of Sofia University "St. Kliment Ohridski" for the academic position "Associate professor" in the scientific field and professional direction 4.5 Mathematics (Differential Equations). In particular, the applicant meets the minimum national requirements in the professional field and no plagiarism has been detected in the scientific paper submitted at the competition.

I give my positive opinion to the application.

II. GENERAL CONCLUSION

On the basis of the above mentioned, I recommend that the Academic board to propose to the authority for the selection of the Faculty of Mathematics and Informatics at Sofia University "St. Kliment Ohridski" to choose Senior assistant PhD Tsvetan Dimitrov Hristov to take the academic position of Associate Professor in the professional field 4.5 Mathematics (Differential Equations).

15.11.2019

Report's author:

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