REPORT

on a competition for occupying the academic position "Associate Professor"
in the professional field 4.5. Mathematics (Ordinary Differential Equations,
Hamiltonian Systems and Applications),
for the needs of Sofia University "St. Kliment Ohridski" (SU),
Faculty of Mathematics and Informatics (FMI),
announced in State Gazette, Issue 56/30.06.2023 and on the websites of FMI and SU

The report (opinion) has been written by Tihomir Ilchev Valchev, PhD, Assoc. Professor at the Institute of Mathematics and Informatics, Bulgarian Academy of Sciences. I was appointed a member of the scientific jury by order No РД 38-514/29.08.2023 of the Rector of Sofia University for the competition for occupying the academic position "Associate Professor" in the professional field 4.5. Mathematics (Ordinary Differential Equations, Hamiltonian Systems and Applications), announced in State Gazette, Issue 56/30.06.2023 and on the websites of FMI and SU.

The following applicants submitted documents for participation in the announced competition:

- Chief Assist. Prof. Dr. Georgi Ivanov Georgiev, FMI, SU;
- Chief Assist. Prof. Dr. Svetlin Georgiev Georgiev, FMI, SU.

On the basis of a submitted application dated 14.09.2023 by Chief Assist. Prof. Dr. Georgi Ivanov Georgiev to the Rector of SU to withdraw his documents from the current competition, in connection with an already won competition (State Gazette, Issue 24/17.03.2023), which was approved by the Rector, I will prepare an opinion only for the second applicant Chief Assist. Prof. Dr. Svetlin Georgiev Georgiev.

I. General Description of the Submitted Documents

1. Information about the competition documents

The applicant Dr. Svetlin Georgiev has submitted 10 works for participation in the competition: 1 paper in a foreign scientific journal and 9 books. The following documents required by the Regulations on the Conditions and Procedure for Obtaining Academic Degrees and Occupying Academic Positions at Sofia University "St. Kliment Ohridski" (RCPOADOAPSU) have also been submitted: application form for accessing the competition (signed and unsigned); CV; copies of Master's and PhD diplomas; a copy of the annex agreement for appointment to the academic position "Chief Assistant Professor"; certificate for length of service; medical certificates; criminal record certificate; a complete list of publications; a list of publications for participation in the competition; a list of publication, conference participations, projects and supervision of undergraduates, generated from

"Avtorite" data base; information about minimal national requirements and extra requirements of SU; a list of citations; author's signed statement on the original scientific contributions in the publications for participation in the competition; information in relation to Art. 112, Par. 2 of RCPOADOAPSU; copies of the scientific publications for participation in the competition; abstracts of the scientific publications for participation in the competition in English and Bulgarian; and a copy of the announcement of the competition in State Gazette.

Generally speaking, all documents submitted for the competition are in compliance with the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), the Regulations on the Application of the Law on the Development of the Academic Staff in the Republic of Bulgaria, and the RCPOADOAPSU. However, I would like to make the following remarks about them. First, the applicant's CV is dated 15.10.2019 and some of the information has not been updated. For example, the URL address www.cliffordanalysis.com does not open website of the journal "Clifford Analysis, Clifford Algebras and Their Applications". After browsing the Internet, I could not find confirmation of the claims made in the applicant's CV about his inclusion in world rankings, about coorganizing scientific forums and delivering keynote talks at scientific forums, hence I will not take them into account. Third, although the applicant claims in his application form that he has not submitted documents in relation to Art. 105, Par. 1, Item 2 of the RCPOADOAPSU, the copy of the annex agreement for appointment to the academic position "Chief Assistant Professor" and the certificate for length of service prove the requirement of the above-mentioned normative text are met, i. e. that the applicant has occupied that academic position for more than 2 years now. Fourth, the list of scientific works for participation in the competition contains only the works from the so-called habilitation thesis (2 works), not all 10 works. Fifth, Dr. Georgiev's complete list of publications contains his   papers only thus excluding his books. Sixth, author's signed statement on the original scientific contributions is rather short and uninformative – it does not make it clear what the original contributions are. Seventh, the submitted documents in relation to Art. 112, Par. 2 of the RCPOADOAPSU are not directly related to the requirements in the relevant text of the RCPOADOAPSU, i.e., they do not provide information about the applicant's teaching activity, but duplicate the content of the list of publications for participation in the competition and provide proof of publications existence.

2. Short biographical record of the applicant

Svetlin Georgiev Georgiev completed a Master's degree in Mathematics and Informatics at the Faculty of Mathematics and Informatics of the "St. Cyril and St. Methodius" University of Veliko Tarnovo in 1997 by defending a thesis entitled "On Periodic Solutions of Non-autonomous Systems of the Lotka-Volterra Type". In 2002, the applicant was awarded a PhD degree by the Higher Attestation Commission of the Republic of Bulgaria in the professional field 01.01.05 "Differential Equations" after defending a dissertation entitled "Periodic Solutions of Non-autonomous Systems

of the Lotka-Volterra Type". From 2002 to 2011, Dr. Georgiev worked as an Assist. Professor at the Faculty of Mathematics and Informatics, Sofia University "St. Kliment Ohridski". From 2011 till now, he is a Chief Assist. Professor at the same Faculty.

The applicant's scientific interests cover the following areas: ordinary and partial differential equations, mathematical modeling, isomathematics, quaternion and Clifford analysis. Dr. Georgiev is an advisory editor of the journal "Mathematical Methods in the Applied Sciences" and used to be an editor-in-chief of "Clifford Analysis, Clifford Algebras and Their Applications".

3. General characterization of the applicant's scientific works and achievements

According to Dr. S. Georgiev's CV, the complete list of his scientific works (until 2019) includes 64 items: 15 books and 49 papers in scientific journals. 9 books and 20 papers are indexed in "Scopus", 18 items are indexed in "Web of Science", and 13 papers are published in journals with impact factor. As the check done shows, the applicant also has works indexed in "Scopus" and in "Web of Science", that are not included on the above list (e.g., those published after 2019). At the same time, for some of the papers appearing on the list, namely [39], [36], [35], [34], [32], [25], [20], [17], and [8], I found no information in the Internet. There are 43 single-authored works (13 books and 30 articles, including those with missing information in the Internet). The applicant's scientific results have been reported at 46 international conferences. In general, the applicant's scientific production impresses in terms of quantity.

10 scientific works have been selected for participation in the competition: 1 paper in the journal "Mathematical Methods in the Applied Sciences", impact factor 1.017 (Q1 according to "Web of Science") and 9 books. The books have been published by the following publishing houses: "Springer" (2 books), "Nova Science Publishers" (4 books), "Lambert Academic Publishing" (2 books) and "Atlantis Press" (1 book). Information about the minimal national requirements in relation to Art. 2б of the LDASRB is given in the table below:

Group of indicators	Indicator	Minimal points	Points of the applicant
А	1. PhD thesis	50	50
Б	2. Doctor of Sciences thesis	-	-
В	3. Habilitation thesis – monograph 4. Habilitation thesis – scientific publications, that are indexed and reviewed in world-renowned databases of scientific information	100	175
Г	5. A published monograph that is not submitted as a habilitation thesis	200	240
Д	11. Citations in scientific publications, monographs, collection volumes, and patents, that are indexed and reviewed in world-renowned databases of scientific information	50	56

The points for indicator Д11 have been reduced from 64 to 56 due to duplication of one of the citing sources presented (M. Derhab, M.K.Kloucha, Nonl. Studies, Vol. 25, No. 4, pp. 883-898,

2018). Despite this reduction, it can be seen that the minimal national requirements in relation to Art. 2b, Par. 2 and Par. 3 of the LDASRB and the extra requirements of SU for occupation of the academic position "Associate Professor" in the professional field of the competition are fulfilled.

The publications submitted for the competition have not been used in earlier procedures for occupying academic positions.

No plagiarism has been found in the scientific works submitted for the competition.

4. Characterization and assessment of the applicant's teaching activity

I do not have personal impressions of the applicant's teaching activity. The submitted documents lack information about the lectures/exercises led by him at Sofia University (in relation to Art. 112, Par. 2 of the RCPOADOAPSU).

5. Analysis of the applicant's scientific achievements given in the documents submitted for the competition

The scientific results in the works submitted for the competition are purely theoretical in nature, they enrich the knowledge in various mathematical disciplines, mainly of mathematical analysis. Thematically, the results are classified into the following three areas: mathematical analysis on time scales, theory of partial differential equations, and isomathematics. There is just one joint work among all the works submitted for the competition. Since the applicant has not provided a statement of his personal contribution in that work, I assume that it is equal to that of the other co-author.

The books "Variational Calculus on Time Scales", "Integral Equations on Time Scales" and "Fractional Dynamic Calculus and Fractional Dynamic Equations on Time Scales" belong to the first area. The first book contains a detailed exposition of the calculus of variations on time scales. Dynamical systems and functionals on time scales are considered with an emphasis on Hamiltonian dynamical systems.

The second book is dedicated to integral equations on time scales. Integral equations of the Volterra and Fredholm type, as well as some integro-differential equations, are considered in it. Techniques for finding their solutions and the Hilbert-Schmidt theory of equations with symmetric kernels are developed.

In the book "Fractional Dynamic Calculus and Fractional Dynamic Equations on Time Scales", fractional delta integral, Riemann-Liouville fractional delta derivative, and Caputo fractional derivative are considered. Existence and uniqueness theorems of the corresponding Cauchy problems for fractional equations are proved.

The books "Partial Differential Equations – An Introduction", "Theory of Distributions", and the paper "Noncompact-type Krasnoselskii Fixed Point Theorems and Their Applications" can be classified into the second area. The first book is an introduction to the theory of first and second order

partial differential equations, while the second one contains a detailed exposition of the theory of distributions.

In the above-mentioned paper, generalizations of Krasnoselkii's results for the fixed points of a sum of two operators, one of which is not necessarily continuous or compact, are obtained. Those generalizations allow one to study the existence (and uniqueness) of solutions for classes of transport equations, difference equations, and perturbed Volterra integral equations.

The books in the series "Foundations of Iso-Differential Calculus" contain a detailed exposition of the analysis over the field of so-called isoreal numbers: from the very construction of the isoreal numbers through the differentiation and integration of isofunctions of one and more variables to isodifferential and isodifference equations.

6. Critical remarks and recommendations

My general impression is that the documents for the competition are quite carelessly prepared. The information in them has not been updated upon their submission, there are incompleteness or errors in part of it (wrong titles of works, volume numbers, the name of the applicant, etc.). The ordering of the documents is unnatural and makes it difficult to work with them. In this regard, I would advise the applicant to take more seriously the preparation of documents for competitions in the future. At the same time, I would recommend him to select scientific works to fit better the topic of a competition. Submitting a larger number of articles than books for participation in a competition is, in my opinion, a more natural and more advantageous choice from the point of view of meeting the minimal requirements for occupying an academic position.

7. Personal impressions of the applicant

I do not personally know Chief Assist. Prof. Dr. Svetlin Georgiev Georgiev.

8. Application conclusion

After getting acquainted with all the documents and the scientific works presented in the competition and based on the analysis of their significance and the scientific and applied contributions contained in them, I **do confirm** that all scientific achievements fulfill the requirements of the LDASRB, the Regulations on the Application of the LDASRB, and the corresponding Regulations at Sofia University "St. Kliment Ohridski" for occupying by an applicant the academic position "Associate Professor" in the scientific domain and the professional field of the competition. In particular, the applicant fulfills the minimal national requirements in the professional field. No plagiarism has been found in the scientific works submitted for the competition.

I express my **positive** assessment to the application.

II. GENERAL CONCLUSION

Taking into account the above stated, I **will confidently join** a decision of the Scientific Jury to propose to the competent body of the Faculty of Mathematics and Informatics, Sofia University "St. Kliment Ohridski" to elect Chief Assist. Prof. Dr. Svetlin Georgiev Georgiev for the academic position "Associate Professor" in the professional field 4.5. Mathematics (Ordinary Differential Equations, Hamiltonian Systems and Applications).

Sofia,

25.10.2023   Jury member:

                                                            /Assoc. Prof. Tihomir Valchev, PhD/