

R E P O R T

by Corresponding Member of BAS Oleg Krastev Mushkarov,
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related to the procedure of application for appointment to the academic post **Professor** in the Institute of Mathematics and Informatics - BAS, Area of Higher Education: 4. Natural Sciences, Mathematics and Informatics; Professional field: 4.5 Mathematics; Scientific specialty: Mathematical Analysis (Special functions), announced in State Gazette (SG), No. 52, from 02.07.2019.

I am presenting my report related to this procedure as an assessor of an Academic Board, formed with Order No. 321/02.09.2019 of the Director of IMI Academician V. Drenski. It is prepared according to the requirements of:

- The Law Act for Development of the Academic Staff in the Republic of Bulgaria (LADASRB);
- The Statutes for application of LADASRB;
- The Statutes for the conditions and regulations for acquiring academic degrees and occupying academic posts in BAS;
- The Statutes for the conditions and regulations for acquiring academic degrees and occupying academic posts in IMI-BAS.

One applicant has presented the required documentation for participation in the procedure: Associate Professor Jordanka Dobрева Paneva-Konovska, D.Sc.

1. General Information about the Applicant

Asso. Prof. J. Paneva-Konovska was born on 18.04.1955 in the town of Devnya, and graduated from 3rd Mathematical High School Acad. Metodi Popov, Varna in 1973. In the same year she was admitted as a student in the Faculty of Natural Sciences and Mathematics (FNSM) of the Higher Pedagogical Institute (HPI) in Shumen, which she graduated from in 1977 with the qualification: Mathematician. From 1977 to 1979 she has been an intern assistant, and from 1981 to 1987 an assistant in the Department of Mathematical Analysis of FNSM, HPI - Shumen. From 1987 to 2008 she has been consecutively assistant, and senior assistant in the Department of Mathematical Analysis and Numerical Methods at the Faculty for Applied Mathematics and Informatics (FAMI) of the Technical University (TU), Sofia. From 1996 to 1999 Asso.Prof. J. Paneva-Konovska was a Ph.D. student in Section Complex Analysis of IMI-BAS. In 1999 she defended her thesis titled Basicity and Completeness of Countable Systems of Bessel Functions and Polynomials, and was awarded the academic degree Ph.D. in Mathematics, professional field Mathematical Analysis. In 2008 she got her habilitation as an Associate Professor with the same specialty in the Department of Mathematical Analysis and Numerical Methods at

FAMI-TU, Sofia, which in 2016 was transformed into Department of Mathematical Analysis and Differential Equations. Since 2014 she has been working part-time as an Associate Professor in Section Analysis, Geometry and Topology of IMI-BAS. In 2018 she was awarded the academic degree Doctor of Sciences after the defense of her thesis titled Bessel and Mittag-Leffler Functions and Generalizations.

Since 2007 Asso. Prof. J. Paneva-Konovska has been a member of the Faculty Council of FAMI, and from 2008 to 2013 she has been a member and Chair of the Quality of Education faculty committee. From 2012 to 2013 she has been vice chair of the Department of Mathematical Analysis and Numerical Methods, and vice dean of FAMI.

Asso.Prof. J. Paneva-Konovska has published a total of 61 research articles, 2 monographs, 2 textbooks, and 2 study guides. They have been cited 148 times, of which 70 times in journals with impact-factor. Her h-index is $h=7$ (Web of Sciences), $h=8$ (Scopus), and $h=12$ (Google Scholar). She has participated in 5 international scientific projects, 4 with National Science Fund-Bulgaria, 3 internal scientific projects of IMI-BAS, and 4 internal research projects of TU-Sofia. Asso.Prof. J. Paneva-Konovska has been the scientific advisor of 3 master's students, and scientific consultant to 1 doctoral student. She is a member of the editorial board of the International Journal of Applied Mathematics, and a reviewer for several other international scientific journals.

2. General Characteristics of the Application Materials.

Asso.Prof. J. Paneva-Konovska has submitted for consideration under the application procedure 25 research articles, 1 monograph, 2 textbooks, and 2 study guides, which have not been presented in association to her dissertation and her habilitation as an Associate Professor. I would like to note that 3 of the research articles have been published in journals with impact-factor (Compt. Rend. Acad. Bulg. Sci. - 2, Fract. Calc. Appl. Anal. - 1), and 10 of them in journals with SJR. On the monograph and 24 of the submitted research papers she is the only author, and 1 article is joint with I. Nikolova. The textbooks [2,4] and the study guides [1,3] are respectively: *Complex Numbers, Function of a Complex Variable*, published by Avangard Prima, Sofia, 2012, *Mathematical Analysis 2*, published by TU-Sofia, 2018, *The Laplace transform in Examples and Problems*, published by TU-Sofia, 2012, *A Guide to Mathematical Analysis Aided by MAPLE*, published by TU-Sofia, 2014. The first textbook is written jointly with L. Garnevska and R. Petrova, the second study guide is written jointly with T. Stancheva. It is my opinion that in the joint publications the contribution of the applicant is equivalent to the one of the co-authors. Asso.Prof. J. Paneva-Konovska has attached a list of 69 citations of the papers submitted for this procedure. Of these, 37 are in journals with impact-factor, 8 are in journals with SJR, and 3 are in monographs.

3. Area of Scientific Interests and Assessment of Contributions.

The main scientific interests of Asso.Prof. J. Paneva-Konovska are in the area of mathematical analysis, more precisely in the theory of special functions, series of special functions, integral transforms, fractional calculus and the teaching of

mathematics at institutions of higher education. Her contributions in these areas are described in detail in the attached author reference. Of these, I will note the following:

1. The research on the functions of Bessel and Mittag-Leffler type. There are obtained asymptotic formulas and estimates for the modulus of the respective remainder term, which describe the behavior of the functions for large values of the parameters. These results are published in articles [1-6, 10].
2. The obtained analogues of important classical results of complex analysis for series of functions of Bessel and Mittag-Leffler type. Of these, I will note the ones related to the Cauchy-Hadamard formula and Abel's lemma, the theorems of Tauber, Littlewood, and Fatoux, the research on superconvergence of the type of Ostrovski and Hadamard. The research in this area is published in articles [1-5, 7-9, 11-13, 14-18, 19-21, 23].
3. The discovered connections between different kinds of functions of Bessel and Mittag-Leffler type, and derivatives and integrals of arbitrary order of functions of the same type. The results in this direction are related to the fractional calculus in the investigated classes of multi-index functions, and are motivated by recent results of Bazhlekova and Dimovski. They are published in articles [11, 24-26].
4. The results about zeros of entire functions of exponential type defined by finite Hankel transforms. They are presented in the monograph [1].
5. The paper [22] and the study guide [1] about the application of the Laplace transform and the computer software Maple to the teaching of mathematical analysis at the higher education level.

4. Education Activity.

Asso.Prof. J. Panova-Konovska has an almost 40-year long active academic career. She has taught lectures and held seminar classes in Mathematical Analysis I and II for students from specialties Informatics and Software Sciences and Applied Mathematics and Informatics, Complex Analysis for students in the specialty Applied Mathematics and Informatics, all the basic mathematical disciplines, as well as selected topics from higher mathematics for students from the engineering specialties at TU-Sofia. As already noted, she is the author of 2 textbooks and 2 study guides for the students at the Faculty of Applied Mathematics and Informatics of TU-Sofia, which can be used by students at other universities, as well. She has been the scientific advisor of 3 Master's students, and scientific consultant to 1 Doctoral student.

4. Conclusion.

The materials submitted by Asso.Prof. D.Sc. J. Dobreva Paneva-Konovska for the procedure demonstrate that she is satisfying the requirements of the Law Act

for Development of the Academic Staff in the Republic of Bulgaria (LADASRB), the Statutes for application of LADASRB, the Statutes for the conditions and regulations for acquiring academic degrees and occupying academic posts in BAS, and the Statutes for the conditions and regulations for acquiring academic degrees and occupying academic posts in IMI-BAS, for occupying the academic post "Professor". There is no data for plagiarism. I assess very positively her long-time research and pedagogical activity and recommend with conviction to the honorable jury to propose to the Scientific Council of IMI-BAS to elect Asso.Prof. D.Sc. J. Dobrova Paneva-Konovska as a "Professor" in the Area of Higher Education: 4. Natural Sciences, Mathematics and Informatics; Professional field: 4.5 Mathematics; Scientific specialty: Mathematical Analysis (Special functions).

October 24, 2019

Signed:

(Oleg Mushkarov)