STATEMENT REPORT

On the competition for the academic position of "Professor"
In the Scientific field: 4. Natural Sciences, Mathematics, and Informatics,
Professional field: 4.5. Mathematics (Finite Geometries),
For the needs of the Faculty of Mathematics and Informatics,
Sofia University "St. Kliment Ohridski",
Competition announced in State Gazette no. 67(04.08.2023)

This statement report has been prepared by Professor Maya Miteva Stoyanova, Department of Algebra, Faculty of Mathematics and Informatics, Sofia University "St. Kliment Ohridski", as a chair of the scientific jury for the competition according to Order RD 38-576 / 05.10.2023 of the Rector of the Sofia University "St. Kliment Ohridski" and decision of the scientific jury at the first meeting on 12.10.2023.

Documents from one candidate, namely Associate Professor Assia Petrova Rousseva-Landjeva, Doctor of Science, Department of Geometry, Faculty of Mathematics and Informatics (FMI), Sofia University "St. Kliment Ohridski" (SU), were submitted in time for participation in the announced competition.

1. Data on the applicant and submitted documents

The documents submitted (in electronic format) by the candidate in accordance with the competition comply with the requirements of the Act for the Development of the Academic Personnel of the Republic of Bulgaria (ADAP of the RB), the Rules for Implementation of the ADAP of the Republic of Bulgaria (RIADAP of the RB) and the Rules on the Terms and Requirements for Acquisition of Scientific Degrees and Occupation of Academic Positions at Sofia University "St. Kliment Ohridski". All documents have been prepared with great care, complying with the guidelines laid down by SU and FMI and provide detailed and complete information about the scientific research activity and teaching work of Assoc. Prof. Rousseva-Landjeva, Doctor of Science.

The set of the documents submitted by the candidate show that Assoc. Prof. Assia Rousseva-Landjeva meets the requirements of Art. 24 of the ADAP of the RB, and Art. 53 of the RIADAP of the RB for the occupation of the academic position "Professor".

2. Short CV of the applicant

In 1988, Assia Petrova Rousseva graduated from the Faculty of Mathematics and Informatics of Sofia University with a Master's degree in Mathematics, specializing in

Geometry. In 2005, after defending a dissertation on the topic "Arches in finite projective geometries and their application in coding theory", she acquired the Ph.D. In 2020, after defending a dissertation on the topic "Finite geometries of codes", Associate Professor Assia Rousseva-Landjeva obtained the scientific degree "Doctor of Sciences". Since 1993, she has been a full-time teacher in the Department of Geometry at FMI-SU, successively as an assistant, chief assistant, and since April 2009 he has held the academic position of "Associate Professor".

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

The full list of publications of Assia Petrova Rousseva-Landjeva, Ph.D., consists of 55 titles in the field of finite geometries and their applications in coding theory. A list of 18 publications was submitted for participation in this competition, of which 11 publications are in scientific journals with an impact factor (IF, Web of Science), another 4 publications are with an impact rank (SJR, Scopus), and the remaining 3 publications are indexed in MathSciNet, zbMATH, or IEEE Xplore. I confirm that none of these eighteen publications (presented in the competition), as well as all the citations under criterion D in the Reference on the implementation of the minimum national requirements under Art. 2b, para. (2) and (3) of the ADAP of the Republic of Bulgaria were not used in previous procedures (for the acquisition of the Ph.D. and Doctor of Sciences) and competitions (for academic position of assistant, assistant professor and associate professor). Furthermore, there are no signs of plagiarism. For many years, I have known the scientific work of Assoc. Prof. Assia Rousseva, and I believe that in the joint publications her scientific contribution is equal to the contributions of her co-authors.

From the report submitted by Associate Professor Assia Rousseva-Landjeva on the fulfillment of the minimum national requirements (under Art. 2b, para. (2) and (3) of the ADAP of the Republic of Bulgaria) for a competition for the academic position of "Professor" in Professional field 4.5.Mathematics, it can be seen that the candidate meets and exceeds the required number of points for each of the indicators, namely 120 points for indicator B (with the required 100), 543 points for indicator D (with the required 200), 124 points for indicator D (with the required 100) and 115 points on indicator E (out of 100 required). I have no doubts about the originality and high scientific contribution of the results of Assoc. Prof. Assia Rousseva-Landjeva, Doctor of Science, and I would like to especially note that the book "Aspects of Combinatorics" presented in indicator E is not just useful as a textbook for mathematics and informatics students, but also as a monographic source on combinatorics for the entire mathematical college.

4. Description and evaluation of the candidate`s teaching experience

Since 1988, after completing her higher education, Assia Petrova Rousseva began working as a part-time teacher at the Geometry Department of FMI-SU. As I mentioned above, from 1993 to the present she has been a full-time teacher, and a member of the Geometry Department, who has grown step by step along the scientific and academic path. The report presented in the submitted documents shows that since the academic 2013/2014, she has always had full academic employment and has always exceeded the required auditorium and general teaching workload. Associate Professor Assia Rousseva gives lectures and exercises on the main courses and on a number of specialized elective subjects taught by the Department of Geometry. She is a respected teacher and scientist, both among the students and the colleagues of Faculty of Mathematics and Informatics.

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

The scientific interests of Assoc. Prof. Assia Rousseva-Landjeva are in the field of finite geometries and their applications in cryptography and coding theory. Following the numbering from the list of publications submitted by the candidate, as well as the summaries to them in document 17, in article [1] the rank of the incidence matrix of the Yelmslev projective plane is determined. The obtained results in [5] characterize minihypers (blocking sets) with certain parameters in PG(3, q) geometries, and in paper [14] a geometric approach to the accuracy of the Griesmer limit is used.

In publications [2, 4, 8--13, 15, 16] constructions of different types of arcs and characterization of their parameters are considered. For example, in [4] the (t mod q)-arcs introduced by Rousseva and Landjev are used as a tool for formulating and proving the extensibility of codes and arcs, which leads to new classification results for the studied objects. In [11] all in PG(r,q) are characterized for which the hyperplanes have multiplicity w, w+1 and w+2. This characterizes all linear codes whose nonzero weights are d, d+1, or d+2.

In publications [3, 6] binary codes with few weights and distances are studied. For them the bounds on maximal cardinality and some constructions are obtained. This leads to prove of hypotheses formulated by other authors working in the subject such as Erdős, Ko, Rado and others. Results related to blocking sets were obtained and presented by the candidate in articles [7, 17, 18].

The abstracts of the publications and the summary of the scientific contributions are presented by the candidate accurately, clearly and faithfully reflect the content of the publications and the scientific contributions of Assia Rousseva-Landjeva.

6. Reviewer's opinion about the candidate

I have known Associate Professor Assia Petrova Rousseva-Landjeva for more than 20 years. I was the chairman of the scientific jury for the procedure for public defense of a dissertation work for the acquisition of the scientific degree "Doctor of Sciences". I have attended many of her presentations at national and international scientific forums and I have excellent impressions of both the systematicity of her research, the originality and quality of her scientific achievements, as well as their excellent presentation to the scientific board.

7. Conclusions about the candidature

Having become acquainted with the documents and scientific papers presented in the competition and on the basis of the analysis of their importance and the scientific and applied contributions contained therein, I **confirm** that the scientific achievements meet the requirements of the ADAP of the Republic of Bulgaria, the Rules for its Implementation and the corresponding Regulations for the conditions and rules for acquiring scientific degree of the Sofia University "St. Kliment Ohridski" for the occupation by the candidate of the academic position "Professor" in the scientific field and professional field of the competition. In particular, the applicant meets the minimal national requirements in the professional field and no plagiarism has been detected in the scientific papers submitted for the competition.

I **give** my **positive opinion** to the application.

GENERAL CONCLUSION

On the basis of the above said, I **strongly recommend** to the Scientific Jury of the competition to propose to the propose to the Faculty council of Faculty of Mathematics and Informatics of Sofia University "St. Kliment Ohridski" to elect Associate Professor Assia Petrova Rousseva-Landjeva, Doctor of Science, for the academic position "Professor" in professional field 4. Natural Sciences, Mathematics and Informatics, professional fields 4.5.Mathematics (Finite geometries).

November 23, 2023   **S**ignature: ....

/ Prof. Maya Stoyanova, Ph.D. /