

R E P O R T

**on the competition for academic position “Associate Professor”
in professional field 4.5. Mathematics, scientific specialty „Geometry and Topology (Convex
geometry in topological vector spaces)“,
for the needs of the Institute of Mathematics and Informatics
at the Bulgarian Academy of Sciences,
announced in SG, issue 69/11.08.2023**

This report is prepared by **Prof. Velichka Vassileva Milousheva** from the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences, as a member of the Scientific Jury on this procedure according to Order № 467/10.10.2023 of the Director of the Institute of Mathematics and Informatics.

Only one applicant has submitted documents for participation in the announced competition: **Stoyu Tzvetkov Barov, PhD**, Analysis, Geometry and Topology Department of the Institute of Mathematics and Informatics.

I. General description of the presented documents

1. Information about the application

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 Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences.

For participation in the competition, the applicant **Stoyu Tzvetkov Barov** has presented a list of **15** scientific papers, **11** of them being published in journals that are indexed in Web of Science or Scopus and **4** publications in scientific journals, refereed and indexed in MathSciNet. A list of the applicant's citations is also presented, as well as all other required documents (official notes, certificates, references for participation in projects and other relevant evidence), supporting the applicant's achievements.

2. Information for the applicant

According to the submitted CV, the applicant Stoyu Barov was born in 1964. He graduated with a Master's degree at the Sofia University "St. Kliment Ohridski" in 1992 defending a thesis on "*Some properties of gF -topological spaces, spaces of the classes of K and K' , and hyperspaces endowed with the Tychonoff topology*" under the supervision of Prof. Georgi Dimov. In the period 1998 – 2001, he was a PhD student at the University of Alabama, where he defended his PhD thesis "*On Sets with Convex Shadows*" supervised by Prof. Jan J. Dijkstra. Stoyu Barov held the positions of a programmer, mathematician and assistant professor. He taught various mathematical courses at the Sofia University "St. Kliment Ohridski" and the University of Alabama. In the period 2001 – 2004, he held a position of an assistant professor at Ball State University, and from 2004 to the present, he has worked at the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences.

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

The research interests of Stoyu Barov and his papers presented for the competition are in the following three directions: General Topology, Selection Theory and Geometric Tomography/Topology. The methods used in the applicant's research and the scientific results obtained by him represent an original contribution to science and show that Stoyu Barov has an in-depth knowledge in the scientific field of the competition and characterize him as an established scientist in his field.

According to the presented list of publications, Stoyu Barov applies in the current competition for the academic position "Associate Professor" with **15** scientific publications. The publications can be classified according to the place of publishing as follows: **7** papers in journals with impact factor (**1** paper in quartile Q1, **2** papers in quartile Q2, **3** papers in quartile Q3, **1** paper in quartile Q4 according to the JCR of Web of Science), **4** papers without impact factor indexed in Web of Science or Scopus, **1** of which has SJR, and **4** papers refereed in MathSciNet.

Six of the publications presented in this competition are independent, the rest of them are co-authored. I accept as equal the participation of the applicant in all papers in which he is a co-author.

4. Brief analysis of the scientific and scientific-applied achievements of the applicant contained in the documents presented for the competition

Five of the publications presented in the competition are in the field of General Topology (papers [1], [2], [3], [4], and [8]), and the remaining 10 are related to Convex geometry in topological vector spaces. The results in papers [6] and [11] are in the field of Selection Theory and are related to finding different types of selections for a given set-valued map and characterizing different con-

cepts via selections. Characterization theorems are proved on the base of boundary avoiding continuous selections. A characterization of normal and countably paracompact topological spaces via continuous set-avoiding selections is given.

Most of the publications submitted for the competition (papers [9], [10], [12], [13], [14], [15], [16], and [17]) are in the field of Geometric Topology/Tomography and deal with finding important properties and characteristics or retrieving information about an object in a space using information concerning its projections onto planes, called “shadows”. The problem of retrieving information about an object based on its projections in lower dimensional spaces is of importance in many areas of science, and is particularly connected with the problem of reconstructing an object from X-rays.

Completing the analysis of the scientific results in the papers submitted for the competition, I would like to note that they represent a novelty in science having direct applications in various fields of both mathematics and other sciences.

According to the documents submitted by the applicant, Stoyu Barov has **17** citations (without self-citations), most of which are by foreign authors in renowned scientific journals. **14** of the citations are in journals indexed in Web of Science or Scopus, and the remaining **3** are reviewed and indexed in MathSciNet.

Stoyu Barov was a team member of two national scientific projects led by Prof. Stoyan Nedev and funded by the National Science Fund of the Ministry of Education and Science of Bulgaria, and in one foreign project funded by Ball State University.

It can be concluded from the submitted documents and declarations that:

a) the scientific publications meet the minimal national requirements (Item 26, # 2 and 3 of the Act on Development of the Academic Staff in the Republic of Bulgaria) as well as the additional requirements given in the Rules for the conditions and regulations for acquiring scientific degrees and occupying academic positions in the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences, for occupying the academic position “Associate Professor” in the professional field of the competition;

b) the scientific publications submitted for the competition have not been used in previous applications for acquiring a scientific degree or occupying an academic position.

5. Critical remarks and recommendations

I have no significant remarks to the documentation presented for the competition. The documents and necessary references submitted by the applicant are prepared precisely. One of the

papers (number [12] in the presented list) is pointed in the minimum requirements table as category Q3 according to the Web of Science impact factor, but actually it is in category Q2 in the field of Mathematics, which means that paper [12] carries 40 points, instead of 30. On paper [13], SJR=0,371 is not indicated, but the relevant points are correctly given. Paper [16], in addition to MathSciNet, is also indexed in Scopus.

I have no critical remarks on the applicant's scientific work. The review of the documents presented at the competition shows that Stoyu Barov is working on problems of current interest in modern fields of mathematics. As a recommendation, I would note that it would be good to indicate in the author's reference the perspectives for future work on the topic and for application of the achieved results in future research.

6. Conclusion for the application

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 **Stoyu Tzvetkov Barov** 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 Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences, for occupying the academic position “**Associate Professor**” in the scientific area 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 Scientific Council of the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences to elect **Stoyu Tzvetkov Barov, PhD** to occupy the academic position “**Associate Professor**” in the professional field 4.5 Mathematics, scientific specialty „Geometry and Topology (Convex geometry in topological vector spaces)“.

November 15, 2023

Referee:

(Prof. Velichka Milousheva)