O P I N I O N

By Prof. DSc Svetlana Todorova Topalova, IMI-BAS

on the competition for an academic position of Assoc. Professor

in direction of higher education 4. Natural sciences, mathematics and informatics

professional field 4.5. Mathematics (Combinatorics, Graph theory),

for the needs of the Institute of Mathematics and Informatics, BAS (IMI-BAS),

announced in the State newspaper, number 14 / 10.02.2023

and online on the website of IMI-BAS

1. Reason

The present Opinion has been prepared by Prof. DSc Svetlana Topalova, IMI-BAS, as a member of a scientific jury appointed by Order number 185/07.04.2023 of the Director of IMI-BAS on a competition announced in the State newspaper, number 14 of 10.02.2023.

2. Documents

For participation in the competition, the only candidate who has submitted documents is **Danila Dmitrievich Cherkashin, PhD**. The documents submitted for the competition by the candidate comply with the requirements of the Law for the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Rules for the Implementation of the ZRASRB, the Regulations on the terms and conditions for acquiring scientific degrees and for holding academic positions in the Bulgarian Academy of Sciences and the Regulations on the terms and conditions for acquisition of scientific degrees and for holding academic positions at the Institute of Mathematics and Informatics at BAS. The documents meet the requirements and correctly reflect both the scientific activities of the candidate and his employment in national and international research projects.

3. The applicant

Dr. Danila Cherkashin graduated with a master's degree in Mathematics from Saint-Petersburg University in 2015. In 2016-2018 he was a PhD student at the St. Petersburg Department of Steklov Mathematical Institute of the Russian Academy of Sciences and in 2018 he defended a PhD thesis "Extremal problems in hypergraph colorings" under the supervision of A. Raigorodskii and F. Petrov. He worked as a researcher at Moscow Institute of Physics and Technology (MIPT) in 2016–2021 and at St. Petersburg Department of Steklov Mathematical Institute of the Russian Academy of Sciences in 2021–2022. Since 2022 he has been working as postdoctoral researcher at the Institute of Mathematics and Informatics of the Bulgarian Academy of Sciences.

4. Scientific results and publications of the candidate

A general list of publications is presented, containing 19 journal publications, 11 of which for participation in the competition. These 11 articles have not been used in the candidate's PhD thesis. They have been published since 2017 in famous journals in Mathematics and Combinatorics, ten of them in Web of Science, and one in a Scopus journal. Ten of these publications are co-authored. I accept that the candidate's contribution to the joint work is significant and is equal to that of his co-authors. A list with 210 citations (without auto-citations) is presented by the candidate, 108 of which cite works participating in the competition. Regarding the Rules of IMI for the "minimum required points by groups of indicators" for a candidate for associate professor, Dr. Cherkashin has provided proofs for more than the required points in parts G(publications) – 294(min 220), D(citations) – 210(min70), and E(work on projects) – 30(min 20) points. In accordance to the criteria, the presented materials exceed the minimum requirements of IMI-BAS for occupying the academic position "Associate Professor" in the scientific field of the competition and the national scientometric requirements (under Art. 2b, para. 2 and 3 of ZRASRB). The author's summary correctly reflects the content and the contributions in the works of Dr. Danila Cherkashin.

The main topic of Dr. Cherkashin's research are extremal problems on the coloring of hypergraphs with the minimal possible number of colors. The topic is important. It

has various relations to other combinatorial problems. For instance, the problem of finding resolutions of combinatorial designs corresponds to the problem of finding a coloring of the edges of an n-uniform hypergraph with a given number of colors such that the edges of one and the same color are not adjacent. The research on extremal colorings has been very intensive in the latest several decades and many world-famous mathematicians (Erdös, for instance) have contributed to it. One can see this in paper [9] from the list with papers for participation in the competition. It is a survey on the known results and approaches, and 168 papers are cited in it.

5. Critical remarks and recommendations

The numbers of some of the papers in the list of publications submitted for the competition are different from their numbers in the document with the abstracts of these papers. I would like to recommend that the applicant be more careful when preparing the documents for his next professional applications.

6. Conclusion

I think that Dr. Danila Cherkashin fully satisfies the requirements of ZRASRB for the competition position, and there is no plagiarism in the articles submitted for the competition. I recommend to the scientific jury to propose to the Scientific Council of the Institute of Mathematics and Informatics to choose Dr. Danila Cherkashin for associate professor in professional field 4.5 "Mathematics" (Combinatorics, Graph theory).

May 31th, 2023   ....

                                                                      / Professor DSc S. Topalova /