

STATEMENT REPORT

by professor PhD Nikolai Manev,

The Institute of Mathematics and Informatics – BAS

on the dissertation thesis of **Pancho Georgiev Beshkov** entitled

“Toroidal compactifications of discrete quotients of the complex two-ball”

Submitted for acquiring **“Ph. D. degree”**

Area of Higher Education: **4. Natural Sciences, Mathematics and Informatics,**

Professional Field: **4.5 Mathematics**

Ph.D. program: **“Algebra, topology and applications”**

Scientific Adviser: **Professor Azniv Kasparian**

1. General description of the procedure and the applicant

Pancho Beshkov was born in 1987. He received Bachelor degree in 2010 and MS degree with subject “Mathematics and Mathematical Physics” in 2015, both at the Faculty of Mathematics and Informatics of the Sofia University “St. Kliment Ohridski”. Beshkov started his PhD study at 15.02.2017. In the period 2017-2020 Pancho Beshkov was at a part time position as assistant professor. Since 2020 till now he is at full time position as assistant professor.

By order № РД 38-141 / 4.03.2022 of the Rector of the Sofia University “St. Kliment Ohridski” I was appointed as a member of the Scientific Jury. In such a capacity I received all required documents (in digital form) that concern the procedure. The documents shows that the applicant fully meets the minimal national requirements according to the Act on Development of the Academic Staff in the Republic of Bulgaria as well as the Regulations for the conditions and rules for acquiring PhD degree of the Sofia University “St. Kliment Ohridski”.

2. Approbation of the results in the dissertation

The results presented in the dissertation have been published in 2 papers, all with coauthors. One paper has impact factor and the other (in Ann. Sofia Univ.) is indexed by MathSciNet and zbMATH.

The papers have not been used for acquiring other degree or for occupying positions.

3. Assessment of the personal contribution of the applicant in joint works

According to declaration of coauthors and my personal observations I can conclude that the personal contribution of Pancho Beshkov to joint papers is equipollent.

4. Impact of the results on the work of other scientists

Pancho Beshkov has not presented any information about citations of his papers but the Act on Development of the Academic Staff in the Republic of Bulgaria does not require the existence of citations.

5. Quality of the dissertation Abstract

The Abstract contains 19 pages and presents correctly the content of the chapters and the spirit of the dissertation as a whole. It underlines also the main results obtained in the thesis.

6. Description and analysis of results in the thesis

The dissertation thesis contains 123 pages and consists of Introduction, four chapters and Bibliography with 50 titles. The Beshkov's publications concerning the thesis are listed at the end of Introduction as well as into the Abstract.

Chapter 1 and Chapter 2 introduce the numerous notions and facts necessary for reading and understanding the rest of the thesis. The author's original results are given in Chapters 3 and 4.

The thesis studies the smooth toroidal compactifications $(\mathbf{B}/\Gamma)'$ of non-compact quotients \mathbf{B}/Γ of the complex 2-ball \mathbf{B} by a lattice $\Gamma < U(1; 2)$: The accent is on the finite unramified coverings of smooth toroidal compactifications, which are restricted to finite unramified coverings of the corresponding ball quotients and on some numerical invariants of the smooth toroidal compactifications.

Chapter 3 addresses the bijective correspondence between the unramified coverings of a given degree of smooth toroidal compactifications and the unramified coverings of the same degree of their minimal models.

In the last chapter of the thesis under some conditions lower bounds on the number of the cusps of \mathbf{B}/Γ and the number of the non-totally geodesic punctured spheres are obtained.

According to the opinion of Pancho Beshkov his scientific contributions are eight and they are listed on the pages 11 and 12 of the Abstract. First four ones in this list are the result obtained in Chapter 3 and published in the Ann. Sofia Univ., Fac. Math. and Inf., 106, 2019. The next four contributions are obtained in Chapter 4 and published in C. R. Acad. Bulg. Sci., 74(8), 2021. The contributions of Pancho Beshkov are solutions of difficult and interesting problems.

7. Critical remarks

I have no essential critical remarks.

CONCLUSION

The dissertation thesis of Pancho Beshkov contains theoretical results that are original contribution to the studied mathematical area. The thesis fully meets the requirements of the Act on Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its application, and the Regulations for the conditions and rules for acquiring PhD degree of the Sofia University "St. Kliment Ohridski". **Beshkov demonstrates qualities and abilities for carrying out self-depended investigations.**

Based on the aforesaid in this report **I give positive estimation of the considered dissertation and strongly recommend the Scientific Jury to confer on Pancho Georgiev Beshkov the educational and scientific degree "Doctor" in area 4. Natural Sciences, Mathematics and Informatics, professional field: 4.5 Mathematics, Ph.D. program: "Algebra, topology and applications"**

18.04.2022 г.
Sofia

Signature:
Prof. N. L. Manev