

Statement

by associate professor, D.S. Ivan Minchev,
FMI – Sofia University „St. Kliment Ohridski“

Regarding: a competition for the academic position "Associate professor" at the Faculty of mathematics and informatics of the Sofia University „St. Kliment Ohridski", within the higher education field 1. Pedagogical sciences, professional subfield 1.3. Pedagogy of teaching in... (Mathematics), announced in SG, issue 87/ 19.10.2021

Single applicant: Irina Zdravkova Vutova, PhD, chief assistant

This statement is prepared in accordance with a decision (from 22.12.2021) of the Science committee of the competition which was formed accordingly by an ordinance № 38-592/10.12.2021 of the rector of the University.

Holistic application review

Based on the applicants file, in 1998, Irina Zdravkova Vutova receives a master degree in Mathematics and informatics at the Sofia University, Faculty of mathematics and informatics. She receives a second master degree at the Faculty of economics and business administration in 2000. Furthermore, in the same year, she obtained also a Master in economics and management at the Erasmus University, Faculty of Economic Sciences in Rotterdam. Irina Vutova acquired her PhD degree in 2014 under the supervision of prof. Ivan Tonov at the Sofia University, Faculty of mathematics and informatics.

From 1998 to 1999, the applicant was employed as a part-time assistant professor at the Geometry department of FMI-SU and after that, until 2005, she was employed as a math teacher in different secondary schools. Since 2005, the applicant is

a member of the department “Education in Mathematics and Informatics” at FMI-SU, where until 2011 she is a regular assistant and after that a chief assistant. Therefore until now the applicant has gathered more than 16 years of experience as regular employee at the Sofia University where her teaching duties included tutorials in Analytic geometry, Linear algebra, Geometry, Practicum in mathematics, Pedagogy of teaching in mathematics and others. To the best of my knowledge the student’s opinion of her teaching performance has always been very positive.

Irina Vutova is the author of totally 46 scientific publications, of which 4 books, 3 monograph, 13 articles published in scientific journals, 18 articles published in the proceedings of conferences, 3 case-books published in scientific journals and 5 training aids for school children. She has been a participant in numerous international conferences and in 11 research projects.

Reviewing the submitted documents

The application and all submitted documents are in compliance with the requirements of the Habilitation Law in the Republic of Bulgaria and all relevant University regulations.

The candidate participates in the competition with a total of 19 publications: 2 monographs, 14 scientific articles and 3 case-books published in scientific journals. The results obtained in this publications have been cited at least 23 times according to the reference presented by the applicant.

The relevant minimal national requirements to the research as defined for the respective area of higher education in the rules for implementation of the habilitation law are completely satisfied.

Main scientific results and contributions

The scientific production provided by the applicant in the competition is compliant with the requirements of the evaluation system of the indicators for holding the academic position of "associate professor" by activities.

In the two monographs in the application, as well as in a few of the included articles, the authors develop the idea of implementing a vector algebra approach as a tool for solving elementary geometry problems related to the collinearity of points,

the competitiveness of lines and other similar questions often consider in the secondary school. Vector algebra makes it possible to approach problems of this type in a standard way, to avoid additional constructions, as a result of which in many cases the problems become a simple application of vectors. The material is presented in the form of problems and their vector solutions. The tasks are systematized and arranged in didactic systems on the principle of "tasks-components". The study brings us back to the classical analogy in geometry "plane-space", but realized through vector-algebraic modeling, by changing the dimension. This unification leads to the derivation and formulation of a strategy for a "heuristic transition" from the plane to spaces of three or more dimensions by "upgrading" plane theorems and constructing their spatial analogues. The investigations here include the introduction of a few additional concepts such as an elementary and diagonal point configuration - analogues of the concepts triangle (tetrahedron) and quadrilateral (octahedron).

I shall mention here also the paper „Geometric Method of Solving Liquid Pouring Problems“, which presents and develops the Perelman's geometric method for solving the Poisson problem. The article presents a method for solving problems for overflow of liquids with three vessels (Poisson's problem) as the largest vessel is full and the other two are empty and. The method is based on elementary geometric constructions used by JI Perelman, which are based on the principle of “reflection of the billiard ball from the walls of a rhomboid mass.”

I find especially interesting the approach and the topic of article Г.7.5. from the list of the application which describes the history of the mathematics and the mathematical education in the Byzantine empire, where the authors reveal the strong influence of the Byzantine school of mathematics on the mathematical knowledge especially in Eastern Europe.

Based on the submitted information, I believe that all presented works in the application are original and the scientific contribution to each one of them of the applicant is significant. There is indication for any sort of plagiarism in the scientific work of the applicant.

Conclusion

The scientific production presented by Irina Vutova, PhD, completely satisfy the requirements of the Law on the Development of the Academic staff in the Republic of Bulgaria and the requirements of its implementation, as well as the regulations of the Sofia University concerning the acquiring of the academic positions “associate professor”. I express my very positive assessment of the academic activities of the candidate

chief Assistant Irina Zdravkova Vutova, PhD

and recommend to the Faculty Council of FMI-SU her election for the position.

Date: 04.02.2022 г.

Signature:

(I. Minchev)