

OPINION

by **Assoc. Prof. Eng. Veska Georgieva Lasheva, PhD**, University of Chemical Technology and Metallurgy – Sofia, Faculty of Chemical Technology

on the scientific works of **Chief Assistant Prof. Eng. Martin Ivanov Pushkarov PhD**,

submitted for participation in a competition for the academic position of "Associate Professor" in the field of higher education: 5. Technical Sciences, professional field 5.8. Exploration, extraction and processing of minerals, scientific specialty "Open and underwater mining of minerals" for the needs of the Department of "Minerals Development", Mining and Geological University "St. Ivan Rilski", Sofia, announced in the State Gazette, issue 36 of 17.04.2026.

Basis for submitting the opinion: Participation in the Scientific Jury in accordance with the approved order No. RD-13-22/18.05.2026 of the Rector of the Mining and Geological University "St. Ivan Rilski"

1. General information

Chief Assistant Prof. Martin Pushkarov is a lecturer in the Department of Mineral Resources Development at the MGU "St. Ivan Rilski". He graduated from the "A. S. Popov" Professional High School of Audio, Video and Telecommunications - Sofia, then higher education - Bachelor's and Master's Degrees in Hydraulic and Pneumatic Engineering at the Technical University - Sofia and Master's Degrees - Open Pit Mining at the MGU "St. Ivan Rilski". He has worked his way up from a student at the MGU to the academic positions of Assistant and Chief Assistant. He is involved with the department and the university, which makes him a suitable candidate for the competition. He has practical experience as a mechanical engineer and manager. He is the only candidate in the announced competition.

2. General description of the submitted materials

The submitted Certificate of Compliance with the Minimum National and Institutional Requirements of Chief Assistant Prof. Martin Pushkarov by groups of indicators "A", "B", "T" and "Д" shows that the candidate's scientometric indicators are 463.68 points, with a required minimum of 400 points.

Chief Assistant Prof. Martin Pushkarov participated in the competition with 1 monograph and 28 publications. The monograph "Numerical Modeling and Experimental Analysis of Pollution in Mine Waters during Mining Activities" ISBN 978-954-353-507-1, Publishing House "St. Ivan Rilski" of MGU "St. Ivan Rilski", Sofia, 2026 is presented on 129 pages. The monograph presents studies of the processes of formation, composition, distribution and purification of acidic mine waters generated as a result of mining activities, as well as the development of methods for their mathematical modeling and engineering management.

The scientific publications included in the competition in publications that are referenced and indexed in the world databases of scientific information are 21 pieces and the scientific publications that are in non-referenced are 7 pieces. Most publications are in a team of scientists, as well as 2 are independent publications, with 23 in English and 5 in Bulgarian.

The materials presented by Chief Assistant Prof. Martin Pushkarov include a complete list of the necessary documents. They are well and in detail formatted.

3. General characteristics of the candidate's scientific, research and pedagogical activities

The monograph by Chief Assistant Prof. Martin Pushkarov "Numerical Modeling and Experimental Analysis of Pollution in Mine Waters in Mining Activities" is structured in 7 chapters, and its relevance is determined by the increasing impact of mine waters on water resources and the need to implement effective technological solutions to limit environmental risks. The scientific publications included in the competition have an interdisciplinary nature and a clearly expressed practical focus. They demonstrate the candidate's good preparation in his training and the knowledge in various fields that he is able to apply. The results obtained contribute to the development of knowledge in the field of hydraulic systems, renewable energy technologies, mathematical modeling and mining engineering, while at the same time offering specific engineering solutions with potential for application in scientific research, education and industrial practice.

The candidate presents a certificate of participation in a total of 8 projects, 7 of which are national research projects, 1 - international project, with 6 of the projects being at the Technical University of Sofia and 2 projects at the Mining and Geological University.

The citations presented by the candidate - 8 in number - show that the scientific community is informed about the results of the research and there is a response to the publications presented in refereed and indexed editions in world-renowned databases.

Chief Assistant Prof. Martin Pushkarov is a lecturer in the Department of Mineral Resources Development and teaches classes to students in the Bachelor's and Master's degree programs, both full-time and part-time. The attached certificate shows that he conducts lecture courses and exercises for students in a total of 6 disciplines.

All these data form the professional profile of the candidate, Chief Assistant Martin Pushkarov as a comprehensively developing scientist and lecturer who meets the requirements and criteria for holding the academic position of "Associate Professor".

4. Contributions

The main scientific, scientific-applied and applied contributions contained in the works presented in the competition by Chief Assistant Prof. Martin Pushkarov can be systematized in the following main areas:

I. Scientific contributions in the field of hydrokinetic turbines and the utilization of the energy of water currents.

The scientific publications in this area present research covering the development, mathematical modeling, numerical simulations, experimental research and optimization of hydrokinetic turbines for using the energy of flowing waters and sea waves.

II. Scientific contributions in the field of hydraulic systems, measurement and diagnostics

Scientific research in this area is aimed at developing new engineering solutions for testing, diagnostics and optimization of hydraulic systems used in mobile machinery, mining equipment and laboratory practice. Particular attention is paid to the development of specialized measuring devices, test benches and diagnostic methodologies, allowing a reliable assessment of the technical condition of hydraulic components. The results obtained are of both scientific and significant scientific and applied nature.

III. Scientific contributions in the field of environmental technologies, sustainable resource use and environmental protection

These publications are aimed at the development and application of modern engineering solutions to limit the negative impact of industrial activities on the environment. The main emphasis is placed on the use of biochar and hydrochar as means of improving soil fertility, on the analysis of atmospheric air quality and emissions from building materials, as well as on the application of the principles of sustainable development in engineering practice. The results obtained demonstrate both scientific novelty and a clearly expressed practical orientation in the field of ecology.

IV. Scientific and applied contributions in the field of engineering design, laboratory systems and digital technologies

Engineering solutions have been developed for the design, construction and implementation of laboratory stands, measuring systems and specialized equipment for the study of hydraulic systems and mining machines. Particular attention is paid to the use of modern CAD/CAE technologies, three-dimensional modeling, engineering simulations (3D printing), which allow for a significant reduction in design time, increased structural reliability and reduced costs in the development of new products.

V. Scientific and applied contributions in the field of mining engineering, mathematical modeling and intelligent technologies

The research presents engineering methods for optimizing technological processes in open-pit mining of minerals, mathematical modeling of transport-crushing-screening complexes, diagnostics of mobile machines and the implementation of digital technologies to increase the efficiency, safety and sustainability of mining production. The results obtained represent a natural continuation of scientific research in the field of engineering modeling and demonstrate the possibilities for applying modern mathematical and digital methods in solving practical problems in mining engineering.

I accept and positively evaluate the contributions presented by Chief Assistant Prof. M. Pushkarov.

5. Critical notes and recommendations

I recommend that Chief Assistant M. Pushkarov direct his efforts to writing and publishing teaching aids, which will be beneficial for his future work.

6. Personal impressions

I do not personally know Chief Assistant Prof. Martin Pushkarov, but I was impressed by the presentation and design of the materials for the competition.

CONCLUSION

Chief Assistant Prof. Martin Pushkarov has a clearly expressed scientific profile as a researcher and lecturer in the field of exploration, extraction and processing of minerals. He successfully combines scientific research, teaching and applied scientific activities in the relevant issues, thus managing to link theory with practice and student training. All this allows him to be defined as a specialist who meets all the criteria and requirements for the academic position of "Associate Professor", for which he is applying. With these qualities, he will contribute to the development of the Department of at the University "St. Ivan Rilski".

Based on the analysis made, I give a positive opinion and I confidently propose to the Scientific Jury to award Chief Assistant Prof. Martin Ivanov Pushkarov the academic position of "Associate Professor" in professional field 5.8. "Exploration, extraction and processing of minerals", scientific specialty "Open and underwater mining of minerals".

27.07.2026 г.

Sofia

Member of the Scientific Jury:

Assoc. Prof. Eng. Veska Lasheva, PhD