STATEMENT

by Assoc. Prof. Dr. Diana Yosifova Dakova, Department of Physics, Faculty of Physics and Technology, Plovdiv University "Paisii Hilendarski"

of the materials submitted for participation in the competition for the occupation of an academic position of "**Associate Professor**" at the Central Laboratory of Applied Physics – Plovdiv, confirmed by the Scientific Council of the Institute of Electronics - BAS, field of higher education 4. Natural sciences, mathematics and informatics, professional field 4.1. Physical Sciences, scientific specialty "Condensed Matter Physics"

1. General presentation of the procedure and the candidate

By order No. 32/21.08.2025 of the Director of the CLAP, I have been appointed as a member of the scientific jury of a competition for the academic position of "**Associate professor**" at the CLPF of BAS - Plovdiv, confirmed by the Scientific Council of the Institute of Electronics - BAS, in professional field 4.1. Physical Sciences, scientific specialty "Condensed Matter Physics", State Gazette issue 55/8 July 2025.

At the first absentee meeting, the scientific jury decided to admit the candidate to the competition and I was assigned to prepare a statement.

The only candidate who submitted documents for participation in the announced competition was Chief assistant professor Dr. Hristo Todorov Kisov from the Central Laboratory of Applied Physics (CLAP), Bulgarian Academy of Sciences – Plovdiv.

The candidate Chief assistant professor Dr. Hristo Kisov participated in the competition with:

- 28 scientific publications that are outside the dissertation. All scientific works are referenced and indexed in world-renowned databases of scientific information (Web of Science и Scopus),
- participation in 5 national and 1 international scientific project,
- information provided for 38 citations.

The presented set of materials is in accordance with the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDAS - RB) and the regulations for its implementation, adopted by the Bulgarian Academy of Sciences and the CLAP-BAS, for occupying the academic position "Associate Professor". The data proposed by the candidate satisfy the requirements of the regulatory documents and exceed the national scientometric criteria for occupying the academic position "Associate Professor" in the field of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.1. Physical Sciences (Condensed Matter Physics).

Brief biographical information of the candidate:

In the period 1991-1996 Hristo Kisov was a **student** at the Faculty of Physics of the Plovdiv University "Paisii Hilendarski", studying Engineering Physics. He defended his thesis on the topic "Investigation of the generation efficiency of two-component systems of lasers of complex organic compounds". For the period 2009 - 2013 he was a **PhD student** at the Department of Laser Engineering and Electronics, Technical University of Sofia, Plovdiv Branch with supervisor Prof. DSc Marin Nenchev (2.20.05). The topic of his dissertation is "Development of solid-state quantum generators based on Neodymium-YAG media with uncompetitive simultaneous generation of a pair of lines and frequencies in the interval 1-1.4 microns".

Soon after defending his dissertation, he began teaching. In 2012/2013, he was a part-time assistant at the Agricultural University, Plovdiv, and in 2015 - a part-time assistant at Plovdiv University. In 2016, he was appointed as an assistant at the Institute of Optical Materials and Technologies (IOMT), " Acad. J. Malinowski ", BAS, Laboratory "Composite and Nanostructured Optical Materials", Sofia., and in 2017 he is already a chief assistant professor. Since 2021, he has been a chief assistant professor at the Central Laboratory of Applied Physics (CLAP) - BAS, Plovdiv. He specialized at the Technical University in Prague, Czech Republic, under the ERASMUS program for the academic year 2009-2010.

I have **personal impressions** of the candidate. I know Hristo Kisov from his student years as a persistent and active student, with a broad knowledge in various fields of physics. He is communicative and responsible. As a teacher, he is demanding, but patient and attentive to students. With these qualities, he has earned the respect of students and colleagues.

2. General characteristics of the candidate's activities

- **Teaching and learning activities:**

Chief Asst. Prof. Dr. Hristo Kisov has a very good teaching activity. He is the scientific supervisor of 9 successfully defended graduates (4 students of the Master's degree program, PU “Paisii Hilendarski” and 5 students from TU, Plovdiv).

- **Scientific research activity:**

The scientific interests of Senior Asst. Prof. Dr. Hristo Kisov are related to current topics in the field of applied physics. His scientific research is in the field of developing devices and technologies for applications in photonics and sensorics. The contributions of his scientific activity not only significantly build on existing knowledge, but the new results obtained provide an opportunity for their practical application. His main scientific contributions are:

1. Development and research of laser media for cavity-free lasers.

- A number of articles report on the obtained organic laser active media (Rh6G + RhB), which is amorphous and self-nanostructured. It is characterized by pulsed excitation in the visible spectral region and has a wide fluorescence spectrum. By using a laser resonator with a spectrally selective element, smoothly tunable laser generation in the spectral region 560 – 610 nm has been obtained. A suitable, safe for humans, technology for obtaining this media has been developed, which is protected by a utility model.
- An organic two-component active media for cavity-free laser emission based on a pair of dyes - Rhodamine 640 and Methylene Blue has been obtained. Possibilities for adding additional nanometric scattering centers (AgNWs – silver nanowires) to it have been investigated. By using an appropriate molar ratio between the two dyes, a tunable multiwavelength resonator-free laser radiation was obtained.
- A resonator-free active laser medium (Au + Rhodanine B + pvp + AgNWs) was obtained and studied, which was placed in a resonator with a special architecture. The main results are a low threshold excitation energy and the ability to control the output parameters of the laser – the emission line, the spectral width and the emission intensity.

2. Development and optimization of laser technologies for deposition of thin nanometric layers of biological materials under vacuum.

- The presented materials report the creation of the first vacuum system at the Institute of Optical Materials and Technologies-BAS, which works with assisted pulsed laser evaporation of biological substances on diffraction gratings.
- The process of assisted pulsed laser evaporation has been optimized in terms of energy, spectral and time parameters of the laser radiation for evaporation of various biomaterials.
- The penetration of laser radiation into turbid tissues has been experimentally and theoretically studied, by determining the absorbed and scattered energy falling on these tissues.
- Study of the disperse composition of model emulsions containing a biopolymer.

As a result of successful research work, Hristo Kissov is a co-author of 28 articles submitted for the competition, published in journals with an impact factor, of which 8 with a quartile Q1 and 2 useful models. He has an h-index - 4 (Scopus). Information is presented about 39 citations and participation in 5 national research projects, one of which he is the leader and one is international project with China (2019). He has actively participated in a number of international and national conferences and forums.

- **Assessment of the candidate's personal contribution:**

Considering my personal impressions and the scientific publications presented, I believe that they are largely the work of the candidate or are the result of teamwork to which he has made a significant contribution. I have no critical remarks or recommendations.

CONCLUSION

The candidate in the competition, Chief assistant professor Dr. Hristo Kisov, has presented a sufficient number of scientific papers published after the materials used in his doctorate. The candidate's works contain significant original scientific and applied contributions that have received international recognition. They have been published in journals with an impact factor. I would like to emphasize that his theoretical developments have significant practical applicability.

The scientific qualification of Chief assistant professor Dr. Hristo Kisov is unquestionable. His results in scientific research activities correspond to and exceed the minimum national requirements adopted in the relevant Regulations of the CLAP at BAS-Plovdiv, confirmed by the Scientific Council of the Institute of Electronics - BAS for the application of the Law on the Development of the Academic Staff in the Republic of Bulgaria.

After reviewing the materials and scientific papers presented in the competition, analyzing their significance and the scientific and applied contributions, I find it reasonable to give my **positive** assessment and I strongly recommend to the Scientific Jury to prepare a report-proposal for the election of Chief assistant professor Dr. Hristo Kisov on the academic position "Associate professor" at the Central Laboratory of Applied Physics in the field of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.1. Physical Sciences, scientific specialty “Condensed Matter Physics”.

21.10. 2025 **Prepared the opinion**: Assoc. Prof. Dr. Diana Dakova