EVALUATION REPORT

On the Contest for the Occupation of the Academic Position "Professor"

announced by ISSF-BAS for the needs of the Central Laboratory of Applied Physics (CLAP)-BAS, Plovdiv in State Gazette #21 of 15.03.2022 in professional direction 4.1. "Physical Sciences" scientific specialty "Physics of Condensed Matter" (Wave Processes).

Candidate: Assoc. DSc Tinko Aleksandrov Eftimov, CLAP-BAS,

Member of the scientific jury: Prof. DSc Nikola Georgiev Malinowski, Institute of Optical Materials and Technologies – BAS

1. **General description of the submitted materials**

(The indicators and quartiles cited below are defined in the Regulations for implementation of the LPAS RB, Professional Area 4.1, Tables 1 and 2)

In the competition for the academic position of "Professor" for the needs of the CLAP-BAS, the only candidate DSc Tinko Aleksandrov Eftimov.

The materials submitted by the candidate for the competition include all documents required by the LPAS RB.

Indicator B4 - habilitation work, 8 publications with quartile Q1, 4 publications with quartile Q2 and 4 publications with quartile Q4 are included, providing 328 points (with a minimum of 100 required). In 11 publications (all with quartile Q1 and Q2) of these total of 16 articles, Tinko Eftimov is first or corresponding author.

Indicator G5 includes a monograph that is not presented as the main habilitation thesis, in which the candidate is the second author (out of a total of two).

Indicator G7: 16 articles are presented: one with quartile Q1, 4 with quartile Q2, 2 with quartile Q3, and 9 with quartile Q4.

Indicator G8: published book chapter or collective monograph - 4 book chapters, all published by Springer, are presented.

Indicator G9 presents one patent registered in 2020. All these provides 331 points for indicator G (with a minimum of 220 required)

The publications with which the candidate applies for the competition for the academic position "professor" were published in the period 2010-2022. All scientific publications presented in indicators B4 and G7 were published after the defense of the dissertation for "doctor" and the competition for "associate professor" and are not included in the NACID database.

Indicator D presents a list of 148 independent citations, 29 of which are defined as essential (296 points out of min. 200).

Indicator E12: a document from higher attestation commission (HAC) for the acquisition of the scientific degree "Doctor of Physical Sciences" is presented.

For *indicators E13-E16*, documents are presented for:

- Supervision of two doctoral students;
- Participation in 4 national projects;

- Participation in an international scientific/educational project
- Management of two scientific/educational projects

Indicator E18: funds coming from projects managed by the applicant are 220,000 BGN. All these provides totally 319 points for *indicator E*, with a minimum required of 150 points.

2. General characteristics of the scientific, scientific-applied and pedagogical activity of the candidate

The scientific and scientific-applied activity of the candidate are in two areas:

1. wave phenomena in optical fibers with applications to sensors and networks for engineering applications;

2. luminescence of solids and liquids, including studies of glasses, crystals and liquids for engineering applications, as well as fluorescence analysis of food products for qualitative characterization.

As a result of scientific and scientific-applied activity related to the first group of activity were published in 33 papers, which were acknowledge as a habilitation work; 96 citations were noticed.

As a result of scientific and scientific-applied activity related to the second group of activity were published one monograph, 32 papers and 52 citations were noticed.

In 70% of the papers from the first area, the candidate is the first and corresponding author, and for the second area - in 52%. Obviously, the candidate has a leading role in these studies, i.e. he formulated the research tasks, participated in the experimental implementation, in summarizing and writing the publications. This is also confirmed by the declarations of his co-authors, referring to articles in which the candidate is not the first author. The wide range of the candidate's research work is impressive - from the creation of fiber-optic elements with certain properties and characteristics (related to the mastery of precise technological processes), the study of these characteristics (related to the mastery of various experimental methods) to the practical implementation in engineering systems for detection and monitoring. This diverse and comprehensive activity, as well as the complex approach to solving research tasks, presents the candidate as a scientist with a very high qualification, which corresponds to the academic position of “professor”.

The pedagogical activity of Tinko Eftimov is also impressive: supervisor of a large number of graduates students (bachelor's and master's) at the Plovdiv University, supervisor of two successfully defended PhD students, lecturer at numerous courses on: optical communications, optical sensors, biosensors, optical diagnostic methods in biology and medicine and others.

3. Main scientific and scientific-applied contributions.

Scientific research contributions in the first thematic area are: modification of a Mach-Zehnder interferometer was proposed and investigated (theoretically and experimentally); wide-spectrum microinterferometers in the spectral range 550 nm – 1700 nm were developed; two-resonance long-period fiber-optic grating as biochemical sensors were

developed; the theoretical analysis of two-resonance long-period fiber-optic grating regarding temperature stability and influence of dispersion was provided; technological process for making long-period grating was created; spectrally and spatially multiplexed sensor systems based on CMOS and CCD photodiode arrays were created; fiber-optic Fabry-Perot interferometer for the detection of acoustic waves was developed. These contributions were reported in 33 articles and one patent and are the subject of 96 citations.

Scientific research contributions in the second thematic area are: for fluorescence analysis of various types of food products for the purpose of quality control numerous of devices were developed; these devices and methods were applied to the analysis of strongly scattering and absorbing media; the minimum number of sources of pumping radiation, as well as their optimal emission wavelengths, for these devices were established; the luminescence time responses of strontium aluminates and its application as temperature sensors were studied; time-coded gamma radiation sensor based on samarium-doped oxyfluoride glasses was developed.

Main scientific and scientific-applied contributions of Tinko Eftimov can be attributed to the following categories: creation of new technologies and methods; obtaining and proving new facts; creating new devices; application of scientific achievements in practice.

4. **Critical remarks of the reviewer on the submitted documents**

I have no critical notes and recommendations. The documents have been prepared carefully, they are structured very conveniently, which makes the work of the scientific jury pleasant. The documents are comprehensive and meet all the requirements of the ISSF-BAS Regulations for the implementation of LPAS RB.

5. Motivated and clearly formulated conclusion

The scientific publications presented by Tinko Eftimov characterize him as a leading specialist in the field of the announced competition, with high qualifications and great international recognition. He is capable of generating new ideas and leading research at the highest scientific level in the field of wave processes, both in fiber-optic systems and devices, and in volume optics. The scientific indicators of Tinko Eftimov far exceed the minimum national requirements for occupying the academic position of “professor”, formulated according to LPAS RB and according related regulations of BAS and ISSF-BAS. Based on the above, I express **my positive opinion** and **support without hesitation the candidacy of DSc. Tinko Aleksandrov Eftimov for the academic position of professor** in the Central Laboratory of Applied Physics - BAS, Plovdiv, professional direction 4.1. "Physical Sciences" scientific specialty "Physics of Condensed Matter" (wave processes).

Date: 06.08.2022 Reviewer:

Prof. DSc N. Malinowski/ signature /