EVALUATION REPORT

on application materials submitted to the recruitment process for the faculty position "professor" in the field of Higher Education 4. Natural Sciences, Mathematics and Informatics, professional division 4.1. Physical Sciences in Condensed Matter (Wave Processes), for the Central Laboratory of Applied Physics in Plovdiv, Bulgarian Academy of Sciences, by Hassan Chamati, Professor DSc, Institute of Solid State Physics – BAS, member of the Scientific Committee, appointed by order № 14 / 20.05.2022 of the director.

The job announcement appeared in the Bulgarian State Gazette, issue No 21 dated 15.03.2022. Tinko Aleksandrov Eftimov is the only candidate to occupy the Faculty position.

1. Biographical information

Tinko Eftimov completed his higher education in 1982, majoring in "Physics Engineering" at the Faculty of Physics of Sofia University "Kliment Ohridski". During the period March 1986 – February 1990, he held the academic positions "assistant professor" and "principal assistant professor" at the Technical University – Sofia. In 1989, he defended a thesis for obtaining the PhD degree. From March 1990 to October 1991, he was a researcher at Helsinki University of Technology in Espoo, Finland, and from July 1995 to September 1997 at the University of Quebec Hull, Canada. From October 1997 to September 2001, he was a Product Engineer at JDSUniphase Corp., Ottawa, Canada. During the period January 2002 – December 2005, he held the academic position "Professor" at the University of Quebec Hull, Canada. From 2006 to 2016, he successively held the academic positions "Associate Professor" and "Professor" at Paisii Hilendarski University, Plovdiv. In 2010, he successfully defended a dissertation for the scientific degree "Doctor of Physical Sciences" before the Specialized Scientific Council for Radiophysics, Physics and Quantum Electronics, Higher Testimonial Committee. From August 2016 up to now, he is a professor at the University of Quebec Hull, Canada. From September 2020 to June 2021, he was director of the Central Laboratory of Applied Physics – Plovdiv – BAS.

2. General description of the submitted materials

The materials submitted by DSc Tinko Eftimov for the recruitment process cover his scientific, applied, teaching and organizational activities. They include one monograph written in Bulgarian, five book chapters, 32 collective scientific publications in refereed journals, indexed in the international scientific information databases WOS and SCOPUS. Moreover, there are works in refereed journals and conference proceedings that do not have quartiles or do not fall into the aforementioned databases. A significant part of these works have been published in prestigious internationally recognized journals. These are: Optics and Laser Technology (2), Sensors (2), Journal of Lightwave Technology (5), Opto-Electronics Review (1), Optical Fiber Technology (2), Optics Communications (2), International Journal of Reasoning- based Intelligent Systems (1), Photonics

Letters from Poland (3), International Journal of Food Properties (1), Optical Materials (1), Journal of Luminescence (1), Cellulose Chemistry and Technology (1), Optik (1) and Bulgarian Chemical Communications (9). It should be noted that these scientific works have undergone review processes at least once before their final acceptance for publication. Additionally, the candidate presents one Bulgarian patent and a list of the applicant's citations in journals indexed in the international scientific information databases WOS and/or SCOPUS. In support of his pedagogical activity, he submits documents for long–term service at Plovdiv University, as well as letters/offers to serve as a scientist in Canadian universities. He provides information about his project activity and documents certifying the amount of funds of projects he managed as a principal investigator. There are also protocols/declarations stating the contribution authorship of each candidate for some scientific works.

3. General characteristics of the activity of the candidate

DSc Tinko Eftimov's scientific research, detailed in his authorship reference, is in two main areas: (a) Fiber-optic structures and sensor systems and (b) Luminescence of solid and liquid media. The first group of studies is devoted to the development of methods and instruments based on fiber-optic refractometers for biochemical applications* [1–13] in particular, and systems and gratings for engineering applications [14–33,67] in general. Theoretical studies have been carried out and models have been proposed for fiber-optic structures that exhibit susceptibility to the change in the refractive index of the investigated substances. This behavior is tightly related to a change in the interference pattern or the resonance wavelength of the grating. Core–cladding interferometers, long-period gratings, Mach-Zehnder micro-interferometers and Fabry-Perot micro-interferometers with low finesse have been built for this purpose. Studies have been conducted to characterize the physical properties of the named structures and their optimal operating conditions have been determined depending on their geometry, the concentration of the investigated substance, temperature and other physical or chemical parameters. Control over the spectral properties of the constructions allows their use for various applications, such as biochemical sensors. In another study, low-finesse Fabry-Perot interferometers for acoustic wave detection were constructed and characterized.

The second group of studies concerns fluorescence analysis of the composition of food products [34–52] as well as luminescence of glasses, crystals and liquids for various engineering applications [53–66,68]. This method is based on obtaining important information from the profiles of the spectrum and the time response of the luminescence and using them for express and contactless analysis to establish the ingredients of food products. The main goal of the research is the creation for mass use of analytical methods based on easily accessible compact light-emitting diode sources, spectrometers and optical fibers for the analysis of small amounts of the substance not exceeding a few microliters. A comparative analysis of the obtained results was made with experimental analytic methods well known in the literature, such as Liquid Chromatography and Differ-

* The papers numbering follows the list of publications submitted to the recruitment process.

ential Scanning Calorimetry. Experimental studies of the spectral responses of crystals and glasses of various compositions have been carried out and the possibility of various applications of the synthesized glasses from strontium aluminates and their impregnation with polymers or doping with samarium oxyfluoride glasses has been studied.

The great potential of fiber-optic structures and luminescence for applications in instrumentation engineering has attracted a great interest from the scientific community. In this regard, the candidate's research concerns fundamental issues such as design and characterization in order to reveal the underlying mechanisms of fiber-optic structures and luminescent materials. This allows the construction of compact appliances for a wide variety of applications. In summary, the candidate's research is diverse and both fundamental and applied. They aim to offer engineering solutions.

For conducting the aforementioned studies, the candidate uses well-known theoretical and experimental approaches that take into account the main optical characteristics of the materials considered. They are skillfully applied to examine a large set of optical constructions, which are subsequently implemented in practice. From the applied point of view, established methods are used to determine the properties of the investigated substances. The obtained interesting results are important from both a scientific and an applied points of view.

The candidate's contributions are related to obtaining and proving new facts in optics and optical methods. Specifically, they concern research in fiber-optic structures and sensor systems, as well as luminescence of solids and liquids.

4. Impact of the scientific publications

The scientific results presented above do not exhaust all the contributions of the candidate. The above statement reflects a summary that speaks of important achievements. The conclusions in the scientific works are well recognized by the scientific community and are reported at national and international scientific events. The citations are numerous and are from scientists and specialists working in the field of physics of wave processes and its application for various technological purposes. The number of noticed citations provided for the evaluation process by other authors is 148. Publication number 9 has the greatest impact in the literature. It is cited the most – 27 times, and the one under number 45 – 12 times.

5. Educational and pedagogical activity

Prof. DSc Tinko Eftimov has many years of educational and pedagogical experience. As stated above, he has held all academic positions from “assistant professor” to “professor” in several higher education institutions in Bulgaria and abroad. He currently lectures at the University of Quebec in Gatineau, Canada. It should be noted that he is the supervisor of two successfully defended PhD students. All this speaks of considerable teaching experience.

The monograph authored by K. Nikolova and T. Eftimov on Fluorescence spectroscopy method for analysis and evaluation of the quality of food products, pub-

lished in 2016, introduces the reader to the basics of the fluorescence spectroscopy method and examines the possibilities of its use for qualitative evaluation of food products and the alteration of their properties as a result of treatment with chemical agents.

6. Fulfillment of the requirements for holding the position

The fulfillment of the minimum requirements by DSc Tinko Eftimov, as a candidate for the academic position "professor", is summarized in the following table:

Class of indicators	indicators	National rules	Requirements of ISSP-BAS	Candidate
A	1	50	50	50
B	2	100	100	100
C	4	100	100	328
D	5,7,8,9	200	220	331
E	11	100	200	296
F	12 – 18	150	150	319

For the fulfillment of indicator C4 (Habilitation), the candidate presents a total of 16 scientific papers, which are distributed as follows: 8 articles in journals with quartile Q1, 4 articles – Q2 and 12 scientific papers in Q4 journals. In 6 (4 Q1 and 2 Q2), he is first author, and in 5 (3 Q1 and 2 Q1) he is second in the author list. For some articles, there are protocols for authorship indicating the contribution of each author. This can be taken as a convincing evidence of his leading role in these works and a confirmation that the habilitation work was largely his personal achievement. Beside the habilitation work, a monograph is presented for the performance of indicator D5, and a total of 18 collective scientific works are submitted for D7 and D8. For indicator D9 – one Bulgarian patent. The achievements of the scientific publications have been cited many times and positively by the international scientific community, which also fulfills indicator E11 – the number of citations presented for the competition is 148 times.

The candidate is a doctor of physical sciences and the supervisor of two successfully defended doctoral students, which is sufficient to satisfy the group of indicators F. For indicators F14, F15 and F16, the candidate presents evidences that he is acting as Principal investigator and/or participates in national projects funded by Bulgarian National Science Fund and international projects. For F18, there are proofs of funds raised.

Owing to the above table, it can be seen that the quantitative indicators in all groups exceed by far the minimum requirements adopted by the Scientific Council of ISSP for holding academic positions, as well as those set in the Regulations for the implementation of the Bulgarian National Law.

7. Critical notes

I have no critical notes.

8. Conclusion

According to the above analysis on the content of the materials submitted for this recruitment process, the significance of the scientific papers, as well as the fact that all group of indicators exceed by far the minimum criteria, I find it reasonable to suggest to the Scientific Jury to recommend to the Scientific Council of ISSP–BAS to elect Professor Tinko Aleksandrov Eftimov to occupy the Faculty position of "Professor" in the professional division 4.1 "Physical Sciences", Physical Sciences in Condensed Matter (Wave Processes), for the Central Laboratory of Applied Physics in Plovdiv, Bulgarian Academy of Sciences.

Sofia, August 08th, 2022 Reviewer:

/ prof. Hassan Chamati, DSc /