

OPINION

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on the competition for holding the academic position "Associate Professor" at IOMT-BAS,
in professional field "4.1. Physical sciences",
scientific field "Electrical, magnetic and optical properties of condensed matter",
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by Assoc. Prof. Dr. Silvia Emilova Angelova,
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member of the scientific jury, appointed by order № RD-15-463 of July 8, 2022,
of the Director of IOMT-BAS

The only participant in the competition, announced in IOMT-BAS for the occupation of the academic position "Associate Professor" in the professional field "4.1. Physical Sciences" ("Electrical, magnetic and optical properties of condensed matter"), is Assist. Prof. Dr. Velichka Strijkova-Kenderova.

The materials, prepared by the candidate and described in the competition application form, are in accordance with the *Development of Academic Staff in the Republic of Bulgaria Act (DASRBA)* and the *Regulations on the conditions and order for acquiring scientific degrees and for holding academic positions in IOMT-BAS*, and include all required documents. All the documents are well formatted and organized. Assist. Prof. Dr. Velichka Strijkova-Kenderova is registered in the *Register of the academic staff in the Republic of Bulgaria*, maintained by the National Centre for Information and Documentation (<https://ras.nacid.bg/dissertation-preview/42165>). Data on her academic degree (PhD; PhD thesis titled "Vacuum deposited polyamide layers - properties and application possibilities") and academic position (Assist. Prof. at IOMT, "Optical transducers" lab) are available.

Assist. Prof. Dr. Velichka Strijkova-Kenderova is a co-author of 67 publications in scientific journals, 41 of which are published in indexed journals with an impact factor/impact rank. In the current competition, she participates with 19 scientific works, which are not part of the PhD dissertation. 9 publications are published in journals of category Q1, 7 publications - category Q2, 3 publications - Q4. The total number of citations is 104 according to Scopus as of the date of preparation of the reference by the candidate. The Hirsch index of Assist. Prof. Dr. Velichka Strijkova-Kenderova according to data from Scopus is 6. The results of the scientific research conducted with the participation of Assist. Prof. Dr. Velichka Strijkova-Kenderova are widely popularized - they have been presented at 26 national and international scientific forums (39 poster/oral presentations).

For participation in the competition Assist. Prof. Dr. Velichka Strijkova-Kenderova presented a reference for the original scientific contributions in scientific publications by indicator groups "C" and "D". In the reference for the original scientific contributions in the scientific publications, included in the group of indicators "C" (equivalent to habilitation thesis) are summarized results published in 6 articles (3*Q1 и 3*Q2) in prestigious international journals - *International Journal of Molecular Sciences* (Q1), *Optical and*

Quantum Electronics (Q2), *Optical Materials* (Q2/Q1), *Photonics* (Q2). Assist. Prof. Dr. Velichka Strijkova-Kenderova is the first author of one of the articles published in *IJMS*, and the second author of the second article in the same journal. The main scientific contributions of the candidate, reflected in the habilitation reference, are related to the characterization of biological objects using atomic force microscopy (AFM) and the study of surface properties of nanomaterials in the form of bulk samples or thin layers. The two topics formulated by the candidate are as follows:

- Morphometric and nanomechanical characteristics of erythrocytes in normal and pathological conditions - in these studies, a number of characteristics of red blood cells are established, which can serve as biomarkers and contribute to the diagnosis of pathologies during pregnancy and in neurodegenerative diseases;

- Investigation of the holographic recording conditions of gratings with tunable polarization and surface relief realized in azopolymer PAZO and in azopolymer nanocomposite layers (with ZnO, Au and goethite nanoparticles) – in combination with other methods used, AFM helps to clarify the mechanism of the interaction of the laser light with the nanocomposite and the ways to improve the optical parameters by introducing nanoparticles into the azopolymer thin films.

13 publications are included in the author reference for the scientific contributions in the publications under indicator “D”, and they are divided into 5 groups according to the type of systems/processes studied:

- Transparent conductive doped zinc oxide layers with applications as transparent electrodes and energy harvesting devices;

- Two-dimensional (2D) dichalcogenides of transition metals as materials with applications in optoelectronics;

- Atomic layer deposition AlN with application in surface acoustic wave devices;

- Development of a polymer dye medium for use as an active medium for lasers;

- Application of surface plasmon resonance for clinical analysis or as a biosensor.

The author reference for this group of articles adequately reflects the scientific contributions of the candidate. The wide range of systems/problems for which atomic force microscopy has been successfully applied is impressive.

The review of the presented materials shows that the scientific interests of Assist. Prof. Dr. Velichka Strijkova-Kenderova are aimed at studying various materials with atomic force microscopy - a modern and widespread method for studying the surface structure and topography of various samples, ensuring the achievement of high precision and resolution on a nanometric scale, as well as investigation of various surface properties of the samples. The candidate applies the method for obtaining images revealing the arrangement and structure of various molecular/supramolecular architectures, including biological objects. There is no doubt that the scientific contributions related to the use of this method are the personal work of the candidate.

I have no critical remarks on the materials submitted for evaluation.

CONCLUSION

The materials submitted by the candidate for participation in the competition exceed the requirements for occupying the academic position of “Associate Professor” according to *DASRBA*, the Regulations for the implementation of *DASRBA*, as well as the minimum requirements of BAS and, respectively, IOMT to the scientific and teaching activities of the candidates for the academic position “Associate Professor”. The total number of scientific works of which Dr. Strijkova-Kenderova is a co-author (67) is much greater than the number of those presented for the competition (19). The candidate has the necessary scientific qualifications and is a specialist in the field in which she works.

I confidently give a positive assessment to the candidates and recommend to the members of the Scientific Jury and of the Scientific Council of IOMT-BAS to choose Assist. Prof. Dr. Velichka Strijkova-Kenderova for “Associate Professor” in direction 4.1. Physical sciences (“Electrical, magnetic and optical properties of condensed matter”).

Sofia

July 22, 2022

/Assoc. Prof. Silvia Angelova, PhD/