

## STATEMENT

on competition procedure for occupation of the academic position “Associate Professor” in the professional field 4.1 Physical Sciences (Electrical, magnetic and optical properties of the condensed matter) published in the Newspaper of the state No. 93/ 26 November 2019 г.

Member of the scientific jury: Prof. DSc Nikolay Nedyalkov Nedyalkov, Institute of electronics, Bulgarian Academy of Sciences

Dr. Kiril Mladenov Kirilov is the sole candidate for the competition procedure. At the present, he is Assistant professor at Physical department of Sofia University “St. Kl. Ohridski”, section “Condensed matter physics and microelectronics”. The presented documents and their content are sufficient for making a clear evaluation and analysis of the candidate’s scientific and teaching activity. In the frame of the procedure, he apply with 16 scientific publications, as 10 of them are published in journals with impact factor. All the paper are published after his PhD graduation, which is an evidence for an active work in this stage of his career. He is the leading author in one publication. Some publications could be mentioned as examples of high quality research activity - Appl. Surf. Sci. (IF-5.155), J. Phys. D (IF-2.083), Coll. Surf. A. (IF-2.752). The list of citations includes 89 references. Dr. Kirilov has taken part in 23 national and international project, leading one of them. His teaching activity comprises lecturing and leading of students experimental activities, and supervising four graduation theses. He has conducted five short-term scholarships in universities abroad. All the necessary data are presented in the table for compliance of the minimal requirements for the candidates for scientific degrees and academic positions. These data including quantities for research and teaching activities cover the requirement introduced by DASRB article 2 b for the position “Assoc. Professor”.

The research activity of Dr. Kiril Kirilov is directed to fabrication and characterization of nanostructures and thin films with a potential application in optoelectronics. According to the personal contributions stated by the candidate, his work in particularly focused in the analysis and characterization of such structures. They includes carbon films, graphene and graphene oxide thin films, nitride thin films as GaInAs(Sb)N, GaAsSb:N, CdSe nanocrystals, and Si nanoparticles. There is a broad range of methods applied for characterization – XPS, SEM, TEM, PL, Raman spectroscopy, EDX, SPV. The contribution of these activities can be found in the detailed characterization of new and modern materials, its application in development of theories of material’s formation and growth, dynamics of their properties, demonstration of new results and enrichment with data of the already developed methods and theories. As examples can be mentioned the definition of processing condition for fabrication of desired graphene structures by laser deposition method; new results on the optical properties of colloidal CdSe nanocrystals and the discussed growth mechanism; development of explanation of the role of atomic configuration on the band gap of InGaAsN thin films.

Contribution of the presented work should also be mentioned in the direction of development of new methods and models for analysis and data processing. Here, works on experimental combination of ellipsometric measurement with electron microscopy can be pointed out. The method is used to estimate the optical properties modifications induced by the electron beam in SEM. Furthermore, a method for analysis of the amplitude and phase spectra in SPV spectroscopy is developed and optimized. The presented methods can be applied for an efficient analytical characterization of a broad range of materials.

The publication of the presented results in journals with a high impact factor in the recent years is an indication for novelty, topicality and high quality of the research work conducted by the candidate.

**Conclusion:**

My analysis of the research activity and achieved results of Dr. Kiril Kirilov convinced me that he is a scientist with important contribution in the field of development and application of different method for detailed characterization of a wide range of materials. He has the necessary skills and capacity to conduct and lead research activity at high level. I have no criticism on the technical representation and the basic interpretation of the data. I would recommend that the citations of the works attached to this application should be shown. This will increase the contribution and the value of the presented results.

Based on the above-mentioned, I clearly express my support for this application and my recommendation to the Scientific jury to propose to the Department council of the Physical Department of Sofia University “St. Kl. Ohridski”, Assist. Prof. Dr. Kiril Kirilov to occupy the academic position “Associate professor” in the professional field 4.1 Physical Sciences

10.02.2020 г.

Prof. N.Nedyalkov