БЪЛГАРСКА АКАДЕМИЯ НА НАУКИТЕ
ИНСТИТУТ ПО
МИНЕРАЛОГИЯ И КРИСТАЛОГРАФИЯ
№ 031 AO-05-05/03,09,25
СОФИЯ

STATEMENT OF REVIEWER

on competition for occupation of the academic position *associate professor in a professional field 4.1. Physical Sciences (Electronic Properties of Nanoscale Thin-Layer Systems) for the needs of the "Structural Crystallography and Materials Science" department at the IMC-BAS*

announced in "State Gazette" No. 36 /29.04.2025

Candidate: *Assistant Dr. Petar Yordanov Yordanov – IMC-BAS*

Member of the Scientific Jury: *Associate Professor Dr. Katerina Lubomirova Zaharieva – IMC-BAS*

1. General characteristics of the presented materials
The list of scientific publications of Assistant Dr. Petar Yordanov includes a total of 17 scientific papers. Of these, 15 publications are presented for participation in the competition for the academic position "associate professor" (I exclude 2 scientific publications No. 3 and 8 to the dissertation). By indicator group B.4. with 4 publications with impact factor in journals with quartile Q1 the candidate achieves 100 points with a minimum number of required 100 points. With 11 publications with impact factor (7 in journals with quartile Q1; 2 publications with quartile Q2 and 2 publications with quartile Q3) – 245 points by indicator group G.7 and 1 patent – 25 points by indicator group G.9, the candidate achieves a total of 270 points in indicator group "G" (sum of indicators from 5 to 10), with a minimum number of required 220 points. In the calculation of the points by indicators from groups G.7 and G.9 I consider that publication No. 16 (15 points) and one patent (25 points) have to be included because the candidate has already included them and presented in his author's reference for the original scientific contributions with which he participates in a competition for the academic position "associate professor". By indicator group D.11 with 50 citations (Scopus) have been achieved 100 points, with a minimum number of required 60 points. The presented scientific publications, patent and citations show that Assistant Dr. Petar Yordanov meets all quantitative indicators of the requirements of the IMC-BAS. I have to be note that by indicator groups "G" and "D" Assistant Dr. Petar Yordanov exceeds the minimum required points. The candidate also participated in two international scientific/scientific-applied projects during the period 2010-2022. The candidate has participated in international scientific events - forums, working and scientific meetings, summer schools with presentations of reports and poster presentations during the period 2004-2022.

2. Main characteristics of the candidate's scientific, applied scientific and pedagogical activities (scientific areas and problems)
The research activities of Assistant Dr. Petar Yordanov include synthesis of polycrystalline samples, epitaxial growth of nanoscale thin-film systems - films and heterostructures on single-crystal substrates (complex oxides of transition metals). His research is also focused on characterization of samples by X-ray diffraction, IR and UV-VIS - spectroscopy, X-ray absorption spectroscopy and scattering, as well as circularly polarized dichroism and study of transport properties - electrical conductivity (respectively electrical resistance), Seebeck coefficient (thermoelectric properties), measurement of time characteristics in the ultrafast transverse

thermoelectric effect, generation of electromagnetic radiation in the terahertz region, model analysis.

3. Main scientific and/or applied scientific contributions with an assessment to what extent they are the candidate's merit

Dr. Petar Yordanov has a main scientific contribution about the synthesis of thin films of $Ca_3Co_4O_9$ from the polycrystalline target by the method of pulsed laser deposition on various single-crystal substrates and the growth of nanosized films of $PdCoO_2$ on Al_2O_3 substrates. His significant contribution is the study of the thermoelectric properties - Seebeck coefficient S and specific electrical resistance ρ, in the temperature range T=300-1000 K. The observation and interpretation of the anomalous increase in the Seebeck coefficient at temperatures T>700 K in thin films grown on $LaAlO_3$ and $SrTiO_3$ substrates. The candidate has a leading role in the characterization of the obtained materials by means of IR and UV-VIS spectroscopy, X-ray structural analysis, atomic force microscopy. Also, when studying the degree of directional growth and morphology, fit-correction procedure and establishment of S_{ab}, S_c and ρ_{ab}, ρ_c along the main crystallographic directions of $PdCoO_2$. I have to be note that Assistant Dr. Petar Yordanov is the main investigator in the patent. The discovery is preserved as a source and method for generating terahertz radiation in the patent.

4. Critical remarks and recommendations on the presented papers

I have no critical remarks on the presented scientific papers.

5. Motivated and well-formulated conclusion

After reviewing the presented scientific publications and materials in the competition and based on the analysis of their significance, conducted scientific research and the scientific contributions contained in them, the candidate satisfies the minimum scientometric indicators provided by the Law on the development of the academic staff in the Republic of Bulgaria and the Regulations of IMC-BAS for occupation of the academic position of "associate professor" in the professional field of the competition. Based on the above, I give a positive assessment and recommend that the scientific jury propose to the Scientific Council of the IMC-BAS to select Assistant Dr. Petar Yordanov Yordanov for occupation of the academic position "associate professor" in the professional field 4.1. Physical Sciences (Electronic properties of nanoscale thin-film systems) for the needs of the "Structural Crystallography and Materials Science" department at the IMC-BAS.

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Date
26.08.2025

Member of the Scientific Jury:
/Associate Professor Dr. Katerina Zaharieva/