



REVIEW

by Prof. Dimiter Enchev Syrakov,
member of the scientific jury in a competition for the academic position of "Professor" in professional field 4.4 "Earth Sciences", scientific specialty "Meteorology", in the section "Modeling of atmospheric pollution", department of Meteorology of NIMH
The competition was published in the State Gazette no. 103 / 10.12.2021

This review was prepared on the basis of the Order of the Director General of NIMH № ND-04-4 from 04.02.2022 and the decision of the scientific jury, taken at the meeting of 15.02.2022. It is in accordance with the requirements of the Law for the development of the academic staff in the Republic of Bulgaria (ZRASRB), the Regulations for its implementation (PPZRASRB) and the Regulations of the NIMH under ZRASRB. The review consists of three parts and a conclusion.

I. Requirements to the candidate

under Art. 29 (1) and Art. 29b of ZRASRB, art. 60 of PPZRASRB and Art. 56 (1), (2) and Art. 57 (1) of the Regulations of the NIMH under ZRASRB

Assoc. Prof. Dr. Emilia Venkova Georgieva, who is the only candidate in the competition, was born in 1958. She graduated from the Faculty of Physics at Sofia University "St. Kliment Ohridski" in 1982 with a master's degree in meteorology. She immediately began to work at the Institute of Geophysics within the Bulgarian Academy of Sciences (now NIGGG) as a physicist, where until 2011 she passed through various scientific degrees - scientist I-III degree and senior scientist II degree (associate professor, certificate of the Higher Attestation Commission № 20713 dated 27.06.2001). In the period 1984-1987 she was a full-time PhD student at the institute and in 1990 she became a candidate of physical sciences (doctor). The topic of the dissertation is "Meteorological aspects of wind energy resources in Bulgaria - numerical models for the restoration of the wind field", and the diploma from the Higher Attestation Commission is № 20500 / 26.07.90. A number of specializations followed: 2 months in Novosibirsk, Russia, in 1984, 10 months at the University of Hanover, Germany, (grant from DAAD) in 1991-1992, at the University of Genoa with ICTP grants (a total of 5 specializations with different duration - from 2 to 12 months). From 2003 to 2006 she was a visiting professor at the University of Genoa, Italy, and from 2008 to 2011 she was employed as a contract agent at the Joint Research Centre (JRC) of the European Commission, Ispra, Italy. In April 2012 she started working at NIMH as an associate professor, where she still works today. She is currently the Head of the Air Pollution Modelling Section at the Department of Meteorology. Her professional experience is mainly in the field of air pollution - modelling, comparison of modelled and observational data, forecast etc.

The commission, including as member also Prof. T. Marinova, Deputy Director General of NIMH, has checked the submitted materials for the competition and has not found any violations of the procedure. Such an examination was also performed by the members of the scientific jury, as a result of which the candidate was allowed to participate in the competition.

II. Requirements for candidate's research and applied research

Art. 29 (1), item 1, item 3, item 4, item 5, item 6, (2) and (3), Art. 29b (1) of ZRASRB, art. 60 (1), item 3, item 4, item 5, (2) and (4) of PPZRASRB, Art. 56 (1), item 1, item 4, item 5, item 6, item 7, (2), (3) of the Regulations of the NIMH under ZRASRB

The scientific production of Assoc. Prof. Dr. E. Georgieva submitted for review meets the condition for non-repeating publications used for obtaining the scientific degree "Doctor" and for acquiring the academic position "Associate Professor". In addition to scientific publications, information is provided on citations, references for participation and management of scientific and applied research projects with internal-institutional, international and external funding. A detailed report on the solved tasks is presented and the summarized contributions are presented. In addition, a report on the fulfilment of the minimum requirements for holding the academic position of "professor" is presented.

SUMMARY TABLE

FOR THE VOLUME AND TYPE OF SCIENTIFIC PRODUCTION under Art. 1a (1) and (2) of PPZRASRB and Art. 2 (4) of the Regulations of the NIMH under ZRASRB

of Assoc. Prof. Dr. Emilia Venkova Georgieva

Group Indicators	For participation in the competition for professor	
	Number of points of the candidate	Required number of points
A	50	50
Б	-	-
B	128	100
Г	262	200
Д	1019	100
E	469	150

From the presented Table it can be seen that in the assessment of the research and the applied activity of the candidate the sum of the points in all groups of indicators is equal to or significantly exceeds the minimum requirements.

I will continue my review following the groups of indicators.

Group A includes the doctoral dissertation defended by the candidate and the points are equal to the minimum required.

Group B is relevant only for a defended dissertation for "Doctor of Science". As long as there is no such defended dissertation, the number of points is 0, as well as the minimum requirements.

From **group B** (indicators № 3 and № 4) points are collected only from indicator 4 - scientific publications (not less than 10) in editions, which are referenced and indexed in world-famous databases with scientific information (60/n points for each publication). Georgieva presented a list of 11 such publications, calculating the corresponding number of points for each of them. As can be seen from the Table above, the total number of points is 128 with a minimum requirement of 100 points for "professor". All presented publications are thematically related to modelling of air pollution and evaluation and analysis of model results. All works are in English and for each of them the corresponding DOI-index is presented. Ten of them have been published in international journals with impact-factors between 0.354 and 5.288 and one in the Spanish journal *Física de la Tierra*. I accept the publications presented in group B (indicator 4) as satisfying the conditions of the minimum requirements.

From **group Г** (indicators №№ 5-9) the candidate benefited from only two indicators. According to indicator 7 (scientific publications in editions, which are referenced and indexed in world-famous databases with scientific information - 40/n points for each publication) assoc. prof. Georgieva presented a list of 23 publications, each one with DOI-index. Fourteen of these articles have been published in international journals with an impact factor ranging from 0.354 to 7.963, and the remaining nine have been published in full text in the proceedings of international conferences held in Bulgaria. The topics of these articles are quite diverse: modelling of air pollution, measurements of concentrations and depositions, chemical composition of precipitation, comparison of model results with measurements. For the indicator 8 (scientific publications in not referenced journals with scientific reviewing or in edited collective volumes - 20/n points for each publication) a list of 13 publications is presented, 12 of which are in English and 1 - in Bulgarian. The publications are distributed as follows: 4 articles in Bulgarian journals, 4 published in full text presentations at international conferences, and 5 of them are sections of collective volumes (some of them related to international initiatives and projects). Each publication is presented with its ISSN or ISBN. The topics are also quite diverse, although all are dedicated to different aspects of air pollution. For each item of indicator's group Г, the corresponding number of points is calculated. The sum of points exceeds the minimum required number. I accept the publications presented in group Г as satisfying the minimum requirements for "professor" in meteorology.

The documents submitted by Georgieva for the competition contain a list of 58 publications, as well as the full text of each of them. The groups B and Г described so far contain 55 publications. The list of publications includes several Guidance documents and software User's Guides and methodologies, that do not bring points, but they are an important indication of the candidate's ability to summarize and pass on her knowledge to the colleagues. Especially important is her participation in the development of a methodology and guidance for assessment of model results used for the purposes of the EU Directive on ambient air quality and cleaner air for Europe (Directive 2008/50/EC), and the related Guide for using the DELTA software package (the so-called DELTA-tool). The software was developed by an international group within the European FAIRMODE initiative. Georgieva also took part in its creation while working at the EC -JRC, Ispra, Italy.

Group Д is dedicated to citations and is represented by 3 indicators (indicators 10, 11 and 12). Georgieva presented her citations on each of these indicators. Indicator 10 (citations in scientific journals, referenced and indexed in world-famous databases with scientific information or in monographs and collective volumes), where 5 points per citation are given, presents 189 citations, i.e. 945 points. 28 publications are cited, where the candidate is a co-author. Two of these publications have 24 citations, one - 19 and two others - 17 citations. In the list with citations Georgieva additionally presented not only the DOI-index of each citing paper, but also the impact-factor of the journal in which the citing article was published. Impact-

factors range from 0.536 (International Journal of Environment and Pollution) to 21,722 (Nature Climate Change). Indicator 11 (citations in monographs and collective volumes with scientific reviewing), where 3 points per citation are given, presents 22 citation articles, i.e. 66 points. 12 works of the candidate were cited, on average 2 citations per article. The smallest number of citations is in indicator 12 (citations in non-referenced journals with scientific reviewing) - 4 citations of 2 points per citation, i.e. 8 points. 4 works by Georgieva are cited, 1 citation per article. The total number of points in this group of indicators is 1019, which is more than 10 times higher than the 100 points required for the academic position "professor".

The last **group E** contains indicators related to participation in and leadership of research and educational projects. Here, Georgieva also shows considerable activity. In her report on minimum requirements, she presented only the most significant projects in which she participated and/or has managed. Presented are 3 projects funded by the Bulgarian National Science Fund, Ministry of Education and Science and Ministry of Environment and Waters, in which she has participated (indicator 15), which lead to 30 points. For the indicator 16 (participation in international research or educational projects) she presents a list of 8 projects, 3 of which are COST activities, other two projects are under bilateral collaboration between BAS and the Italian CNR, two others are led by the EC-JRC, Ispra, and finally a project, where the participants are Bulgarian organizations, but the funding is by the European Regional Development Fund. She scored 160 points from these projects. More important is her project management activity (indicators 17 and 18), which is one of the additional requirements for obtaining the academic position of "professor" in the Regulations of NIMH under ZRASRB. Georgieva presents two projects with national funding and 3 with international funding, of which she scored another 160 points. Finally, in indicator 19, points are added in accordance with the funds received in NIMH. The five projects, led by the candidate, have attracted over BGN 600,000 to the institute, which brings her another 120 points. Thus, in group E Georgieva scored 460 points, which is more than 3 times above the minimum required 150 points. I would like to point out that in this group indicator 21 (published university handbook) has been neglected. During her stay as a visiting professor in Italy, she co-authored 3 manuals for software used in air pollution modelling - wind model, meteorological pre-processor and dispersion model - for the purposes of the Department of Physics at the University of Genoa. From all this it can be seen that the applicant has fulfilled the conditions for obtaining the academic position of "professor" in this group of indicators.

In her documents, the candidate also presented a report on the results of her research and applied research activities – the so called list of contributions. Her overall activity is mainly in the field of numerical modelling of atmospheric processes - from the development of diagnostic models for wind in complex areas (her doctoral dissertation), through modelling and evaluation of the dispersion of pollutants in the air with different complexity models, to the application of models in scientific and applied tasks (assessment of wind energy, analysis of ambient air quality, comparison of model results with measurements and with other models results, development of models for regulatory purposes). In her list of contributions, Georgieva summarized her activities in the following five main areas:

1. Development of a methodology and software product for harmonized assessment of model results for air pollution applications (DELTA-tool)
2. Evaluation of model results using different approaches
3. Study of the deposition of atmospheric pollutants in Bulgaria
4. Use of satellite data in air pollution modeling
5. Study of effects of meteorological parameters and emissions on modelled and/or observed concentrations and depositions of air pollutants.

The document "List of contributions" provides a detailed explanation of each of the contributions in the above areas, as well as the most important relevant publications. I agree with the contributions formulated in this way.

III. Opinions, recommendations and notes

I have known Emilia Georgieva since her student years. All her professional activity has passed before my eyes. I highly appreciate her competence, her ability to work. In recent years we work together, but years ago I used the diagnostic model for wind over complex terrain (DIAMO) created by her in one of my projects. It was a real pleasure to see how the initial homogeneous wind field adapted to the orography in such a way that the river valleys of Northern Bulgaria were outlined. In recent years, Emilia Georgieva has been actively working to expand the use of air pollution models available at NIMH in current new aspects (satellite data acquisition, desert dust transport, pollutant deposits). An important characteristics of the candidate is her ability for collaboration and communication, and her ability for a team work, participating in or leading national or international teams. The excellent knowledge of several foreign languages helps her significantly in all her activities.

Conclusion

The inspection of the submitted materials for the competition did not reveal any violations in the procedure. The requirements of Art. 29 (1), (2), (3), Art. 29b (2), (3) of ZRASRB, art. 60 (1) (2) and (4) and Art. 61 (1), (3) of PPZRASRB Art. 56 (1), item, item 4, item 5, item 6, item 7, (2), (3) of the Regulations of NIMH under ZRASRB are fulfilled.

Based on the acquaintance with the documents of the candidate and the evaluation of her publications, I give a clear and unequivocal assessment that Assoc. Prof. Dr. Emilia Venkova Georgieva fully deserves to be awarded the academic position of "Professor" and call on other members of the Distinguished Scientific jury to join this assessment.

Date:

Reviewer:

/ Prof. DSc. ~~Dimiter Syrakov~~ /