

REVIEW

by Prof. DS Dimiter Enchev Syrakov, a member of scientific jury
in a competition for occupation of academic position "Professor" in NIMH - professional field
4.1. Physical Sciences, Meteorology (Stochastic Models in Meteorology and Hydrology)

This review is prepared on the basis of an Order of the Director General of NIMH No. ND-04-18 dated 02.10.2019 for appointment of a scientific jury and a decision of the first jury meeting on 18.10.2019. It reflects the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for its Implementation (PPZRASRB) and the NIMH Rules on ZRASRB. The review consists of three parts and a conclusion.

I. Requirements to the applicant

According to Art. 29 (1) and Art. 29b of the ZRASRB, Art. 60 of the PPZRASRB and Art. 56 (1), (2) and Art. 57 (1) of the NIMH Regulations on ZRARB.

Assoc. Prof. DS Neyko Mateev Neykov graduated in 1976 from the Faculty of Mathematics and Mechanics, Sofia University "St. Cl. Ohridski" as a Master of Mathematics, specializing in Probability Theory and Mathematical Statistics. In 1996 he defended his PhD thesis titled "Robust Methods in Multivariate Statistical Analysis", and in 2016 became a Doctor of Sciences (DS) defending a thesis titled "Robust Statistical Modeling by Trimming".

After completing his education, he initially worked as a part-time assistant professor in mathematics at the Higher Institute of Food Industry, Plovdiv, and during the period 1978-1988 he was a research associate (III - I degree) at the Central Laboratory for Automation of Biological experiment in Biology United Center of BAS.

In 1988 he was employed by the National Institute of Meteorology and Hydrology as a research associate I degree. In 2001 he was elected associate professor, and since 2007 he is the head of the section "Forecast models and systems" and of the scientific group "Specialized forecasts" of the department "Forecasts and information services". Throughout this period, he has been researching in the field of stochastic modeling and forecasting methods and their application in meteorology, hydrology, oceanology and the environment, creates and develops statistical software for data analysis, participates and manages research and operational projects.

II. Requirements for research and development

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 the PPZRASRB, art. 56 (1), item 1, item 4, item 5, item 6, item 7, (2), (3) of the NIMH Regulations on ZRASRB

SUMMARY TABLE ON THE VOLUME AND TYPE OF SCIENTIFIC PRODUCTION

of Assoc. Prof. DS Neyko Mateev Neykov

under Art. 1a (1) and (2) of the PPZRASRB and Art. 2 (4) of the NIMH Regulations on ZRARB

Indicators Group	For participation in a Professor's competition	
	Number of candidate points	Number of points required
A	50	50
B	100	--
B	100	100
Г	205	200
Д	112	100
E	555	150
Sum	1122	600

Publications. The list of publications, submitted by Assoc. Prof. Neykov under this competition, contains 25 titles, one of which [1] is a monograph and the other 24 are articles.

According to the ZRASRB, "A monograph is a scientific publication that contains a complete and comprehensive examination of a particular subject, problem, or personality, written by one or more authors, adhering to the same view. A monograph is a scholarly work that does not reproduce or summarize existing knowledge, has a scientific editor and / or scientific reviewer, has an ISBN, and is no less than 100 standard pages with 1800 characters per page. It contains extensive content, a comprehensive bibliography, with references to other scientific works. "

The monograph submitted for review is entitled "Stochastic Daily Precipitation Models for Bulgaria". It meets the ZRASRB requirements cited above. It was co-authored with Assoc. Prof. Dr. Plamen Neichev, with whom N. Neykov has many years of cooperation. As required, the applicant has submitted a separation protocol for co-authorship of the monograph. The two authors make the same contribution, and as long as the monograph covers 257 pages, each of them accounts for more than 100 pages, with which I acknowledge publication [1] as a monograph.

The other 24 articles have been published in:

- Bulgarian journals - 5; BJPhys [2,9], BJMH [5,9,10])
- International journals with SJR - 4; [7,8,11,17]
- Proceedings of national conferences - 1 [6]
- Proceedings of international conferences - 5 [4,13,15,17,20]
- Book chapters - 5 [12,16,18,19,21]
- "DFG-BAS" project reports - 3 [22,23,24]
- Article review - 1 [25]

All publications are in English except [21], which is in Russian.

Citations. Seven of the publications submitted for this competition have been cited a total of 56 times in refereed editions - the Scopus and Web of Science (WoS) databases. The distribution of quotations by publication is as follows:

- Article [7] (SJR-Q1) has been cited 7 times in Scopus.
- Article [8] (SJR-Q2) was cited 2 times in Scopus.
- Article [11] (SJR-Q3) was cited 6 times in Scopus.
- Article [12] (WoS, SJR) was cited 3 times in Scopus.
- Article [14] (SJR-Q1) was cited 11 times in WoS.
- Article [18] (SCOPUS) was cited 2 times in WoS.
- Article [19] (WoS, SJR) was cited 25 times in Scopus.

One can notice that from all the submitted papers for review, only those published in renowned scientific journals and papers from international conferences are cited.

Projects. The project activity of Assoc. Prof. Neykov is very significant. According to the information provided, he has participated / managed 34 projects, distributed as follows:

- a) Management of internal projects of the NIMH Scientific Plan - 3.
- b) Management of BAS's EBO Projects (DFG and FAN) - 2.
- c) Participation in internal projects of the NIMH Scientific Plan - 1.
- d) Participation in NSF - 1.
- e) Participation in COST Actions - 4.
- f) Participation in international projects (without income for NIMH) - 14.
- g) Management of Projects with external financing - 4.
- h) Participation in projects with external financing - 5.

The existence of item (g) of the above list certifies that Neykov fulfills one of the most important requirements of the NIMH Regulations on ZRASRB, Art.56(1) item 5. This is an important argument in support of Neikov's claim to become a professor at NIMH.

Implementations. Developments 1, 2, 4, 7 and 8 of items g) and h) are implemented in the practice of the funding organizations. In particular, the developments under item g) are commissioned by the Sofia Municipality and, as a result, there exists operationally operating system for estimation of the potential for pollution of Sofia with dust (PM10), created within the respective projects. Work on improving this system continues aiming to attract new information from real-time measurements of pollution within a new project, again led by the applicant.

Scientific research and application activities. The scientific activity of Assoc. Prof. N. Neykov is in several fields, with the basis of the probabilistic-statistical methods for data modeling and analysis. In his report he classifies the publications submitted for this competition as follows:

- 1) Creation and development of stochastic models of daily rainfall in Bulgaria - publications [1, 2, 3, 6, 7, 8, 9, 13, 15, 16, 17, 23, 24].
- 2) Development of the methodology for analysis of extreme values - publications [5, 14, 18, 19].
- 3) Stochastic modeling of NO₂ hourly concentrations - publication [10].
- 4) Analysis of data in the field of hydrogeology - publications [4, 12].
- 5) Analysis of data from psychophysiological and biochemical experiments - publications [11, 21].
- 6) Robust statistical methods - publication [20].

In accordance with his education, Neykov not only develops new statistical methods (mainly in his doctoral dissertations), but as a long-time employee of NIMH, he intensively

applies these methods to solve various problems in the fields of meteorology, hydrology and the environment, thus contributing to the higher quality work of the Institute as a whole - another important argument in support of his claim to become a professor at NIMH.

Teaching. This activity of the applicant is at the university level - lectures, exercises and guidance of graduates. According to the accompanying statements, it consists of:

- Lectures / exercises at FMM (the Faculty of Mathematics and Mechanics at Sofia University "St. Kl. Ohridski"). In the period 2006-2017, Neykov lectured and taught at the faculty. The subject of the course is "Generalized Linear Models and Extreme Event Models" that is read in the frameworks of Probabilities and Statistics and Mathematical Modeling in Economics. The course fee is about 30 hours of lectures and 15 hours of exercises.
- Graduates guides. The affidavit issued by FMM states that Neykov was the head of 7 faculty graduates.
- Lectures at NIMH. Attached is a service note from the NIMH for the course "Statistics", read out for NIMH doctoral students, within the framework of a project under the Operational Program "Human Resources Development". Twelve PhD students participated in the course. He has completed the exam and certification.
- Lectures abroad. A statement was submitted issued by the University of Torino, Italy. In the period 25-27 January 2007, Neykov delivered lectures on "Introduction to Robust Statistics" for ISASUT (International School of Advanced Studies of the University of Torino) students. The course syllabus is shown in the note presented and contains 9 topics on various aspects of robust statistics.

It can be seen from the above that the teaching activity of the applicant is significant that also corresponds to the title of Professor.

Contributions. After detailed summaries of the approaches and results contained in the submitted publications, Neykov makes a list of 8 main contributions. The first 6 contributions are related to the statistical modeling and forecasting of rainfall both in individual stations and in a cluster of 32 rain stations in Bulgaria. At the same time, successful attempts have been made to forecast the extreme temperatures in the stations under consideration. Multiple probability distributions were tested as well as mixtures of distributions. Various meteorological predictors have been tested. The results were compared with precipitation measurements using training and test data samples. The last two contributions are related to the prediction of NO₂ pollutant concentrations and sea waves.

I commend the summarized contributions made, considering that they are largely self-contained.

III. Opinions, recommendations and notes

I have not found any errors, inaccuracies and omissions in the presented materials. My personal opinion on Assoc. Prof. Neyko Neykov is that he is a distinguished scientist and teacher with active participation in the activities of the Institute.

Here, I would like to touch on another aspect of Neykov's activity, which seems to neglect the law and the regulations for its implementation. It's that Neykov is a Doctor of Science. As can be seen from the summary table of the volume and type of scientific production of the applicant, it satisfies or exceeds the minimum requirements for the various indicators and in

total. The fact that he defended his DS thesis seemed to put him at a disadvantage, because in this competition he could not use his scientific output - articles and citations that he had already "worn out" to defend his second scientific degree. For this he is given only 100 points. We can imagine what this table would look like if this production were reflected, instead. In other words, my view is that a person who defended a major doctoral dissertation does not need so much effort and evidence that he is worthy of becoming a Professor.

Conclusion

As a result of the examination of the submitted materials for the competition, no violations were found in the procedure. All the requirements of Art. 29 (1), (2), (3), Art. 29b (2), (3) of ZRARB, Art. 60 (1) (2) and (4) and Art. 61 (1), (3) of the PPZRASB and Art. 56 (1), item 1, item 4, item 5, item 6, item 7, (2), (3) of the NIMH Regulations on ZRARB.

On the basis of familiarization with the documents of the candidate for the competition and the evaluation of the publications submitted by him, I give a clear and definite assessment that **Assoc. Prof. DS Neyko Mateev Neykov** fully deserves to be awarded the academic title of **Professor** and I invite the other members of the Distinguished Scientific Jury to join this assessment.

Date: 02.12.2019

REVIEWER:

/ Prof. DS Dimitar Enchev Syrakov /