

Opinion

By Jordanka Semkova, DSc, Professor at the Space Research and Technology
Institute-Bulgarian Academy of Sciences

Subject: Competition for the academic position of "Associate Professor" in a
professional field 4.4. Earth Sciences, Department of Seismology and Seismic
Engineering at the National Institute of Geophysics, Geodesy and Geography –
Bulgarian Academy of Science (NIGGG-BAS), published in the State Gazette no. 86
of 15.10.2021.

The opinion was prepared on the basis of Order № 01-263 of 12.11.2021 and in
accordance with the requirements of Section 4 of the Rules for application in NIGGG-
BAS of the Law on the Development of Academic Staff in the Republic of Bulgaria.
Candidate for the academic position "Associate Professor": Dr. Plamena Raykova-
Tsankova, Assistant Professor in the Department of Seismology and Seismic
Engineering at NIGGG-BAS.

Education and professional qualification

Plamena Raykova-Tsankova has been working at the National Institute of
Geophysics, Geodesy and Geography since 2009. In April 2013 she graduated with a
master's degree in geophysics from Sofia University "St. Kliment Ohridski", Faculty
of Physics. In May 2017, she acquired her PhD degree. In the same year she won the
award of the Bulgarian Academy of Sciences: - "Academician Ivan Evstratiev
Geshov" for the youngest scientists up to 30 years, for achievements in the field of
"Climate change, risks and natural resources".

Fulfillment of the requirements for holding the academic position of "Associate Professor"

Assist. Prof. Dr. Plamena Raykova-Tsankova participated in the competition with 41
scientific publications. There are 15 citations of publications.

From the reference for fulfillment of the minimum requirements for holding the
academic position "Associate Professor", defined in the Regulations on the terms and
conditions for obtaining degrees and for holding academic positions in BAS,
respectively the requirements of Art. Assistant Professor, Dr. Plamena Raykova -
Tsankova, it can be seen that the criteria are met as follows:

Indicator A: the participant in the competition has 50 points - Dissertation for the
award of PhD degree in the specialty 01.04.06 "Seismology and internal structure of
the earth" on the topic: "Characteristics of for-aftershock and swarm type seismicity
on the territory of Bulgaria and the surrounding area";

From group of indicators B: the participant has 115 points, from 10 scientific
publications that are referenced and indexed in world-famous databases with scientific
information Scopus, Web of Science, ERIH +;

From the group of indicators G: the participant has 221 points, from 31 scientific
publications that are referenced and indexed in world-famous databases with scientific
information, scientific monographs, non-refereed journals with scientific review or
edited collective volumes;

From group of indicators E: the participant has 30 points, from participation in international and national scientific and educational projects.

From a comparison of the minimum required points in the regulations for application of the Law for the development of the academic staff in the Republic of Bulgaria in NIGGG-BAS by groups of indicators for applying for an associate professor in Professional field 4.4. Earth Sciences and the collected points according to the materials submitted for participation in the competition, it can be seen that for all groups of indicators B-E the collected points correspond to or exceed the minimum required in the regulations.

Evaluation of the main scientific and scientific - applied contributions of the candidate

Scientific activity

The contributions in the publications presented at the competition can be grouped in the following main thematic areas: Research and analysis of seismicity and seismogenic processes in seismoactive zones on the territory of Bulgaria and its adjacent lands; Assessment and analysis of the space - temporal distribution of clusters (foreshocks, aftershocks, swarms) on the territory of Bulgaria and its surroundings; Spectral characteristics of different types of seismic series for the territory of Bulgaria; Seismic hazard assessment.

Plamena Raykova-Tsankova actively participates in the monitoring activities of NOTSSI (National Operative Telemetric System for Seismological Information), as well as in one of the main tasks of the center for creating a catalog of earthquakes in Bulgaria for the period 1981-2019 (publications 28 and 31). The candidate also participates in research on the space-temporal variations of regional seismicity and seismic regime, based on information from NOTSSI presented in most of the publications in the competition (papers 1, 2, 9, 10, 21, 22).

The participant in the competition analyzes and evaluates the space and temporal distribution of the different types of clusters on the territory of Bulgaria and its surroundings (publications 3, 6, 8, 17, 24, 38, 39). The study of these clusters is essential, because some of them like foreshocks are used as a prognostic sign, and aftershocks are a source of information about the physical and mechanical properties of the environment in the rupture area and the processes taking place in it.

Plamena Raykova-Tsankova participates in the application of spectral analysis of seismic waves, which is an important aspect related to seismological research (publications 19, 23, 33, 34, 35).

In the publications of the candidate (publication 27) an assessment of the seismic hazard for the territory of Bulgaria was made. Based on complex geological-geophysical and seismological information, a model of seismic sources (via GIS) with an impact on the seismic hazard on the territory of the country has been created. Plamena Raykova-Tsankova also participated in the preparation of the earthquake scenarios (works 30, 32, 40, 41), which were compared with the observed seismic impacts for the respective cities.

The obtained results show that the earthquake scenarios are reliable and can be applied both in urban and emergency plans and for seismic risk assessment. The use of such scenarios in combination with modern seismic engineering methods can greatly reduce the damage and casualties of future earthquakes.

Scientific - applied contributions

In recent years, Plamena Raykova-Tsankova has been active in applied research, as evidenced by her participation in 17 projects.

Some of these projects are related to seismic hazards both throughout the country and in individual regions related to the design and seismic safety of high-risk facilities (Kozloduy NPP, Aurubis Bulgaria Ada Tepe, Lyulyakovitsa tailings pond).

She is actively involved in projects related to seismic risk reduction, as well as in projects related to environmental protection and risk reduction of adverse events and natural disasters. The candidate has participated in 21 conferences, scientific forums and events, where she presented his results and analyzes.

Conclusion

Having in mind the above, I believe that the scientific and scientific-applied activity of Assist. Prof. Dr. Plamena Raykova-Tsankova, an established specialist with proven qualities, meet the requirements for holding the academic position of "Associate Professor" in a professional field 4.4. Earth Sciences, according to the Development of Academic Staff in the Republic of Bulgaria Act (DASRBA) as well as the Regulations for implementation of DASRBA in NIGGG-BAS. **Therefore, I suggest the honourable members of the scientific jury to propose to the Scientific Council of NIGGG-BAS to elect Dr. Plamena Raykova-Tsankova to the academic position of "Associate Professor".**

08.02.2022

Prof. DSc. J. Semkova