

OPINION

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For the concourse for promotion to the academic position “Associate Professor”,
announced in **State Gazette, issue 21 from 15.03.2022**

Higher Education Area: **4. Natural Sciences, Mathematics and Informatics**

Professional Field: **4.5. Mathematics**

Scientific Specialty: **Mathematical Modelling and Application of Mathematics
(Applications in Computational Physics and Biology)**

Candidate: **Senior Assist. Prof. Elena Boyanova Lilkova, PhD**

Review of the presented materials

With Ordinance No. 131/13.05.2022 of the Director of the Institute of Information and Communication Technologies – Bulgarian Academy of Sciences (IICT – BAS), I have been appointed as a member of the Scientific Jury of a concourse for the **academic position “Associate Professor”** where the only candidate is **Senior Assist. Prof. Elena Boyanova Lilkova, PhD**.

As a member of the Scientific Jury, I have received:

1. Documents regarding the candidate’s participation in the concourse.
2. Copies of the publications, presented for participation in the concourse.

In the presented form, the documents of Senior Assist. Prof. Elena Lilkova, PhD are in full compliance with the requirements stipulated in the Act on Development of the Academic Staff in the Republic of Bulgaria (ADASRB), as well as the Regulations for its applications approved by the Council of Ministers, BAS, and IICT – BAS.

Short biographic notes

Elena Lilkova graduated as M.Sc. in Medical Physics from Sofia University "St. Kliment Ohridski" in 2011. In 2015, she defended a PhD thesis on the topic "Research of Human Interferon gamma through Molecular Dynamic Simulations" again at Sofia University "St. Kliment Ohridski". Elena Lilkova began her scientific career as an Assistant, and in 2017 she was elected to the academic position of Senior Assistant Professor in the “Scientific Calculations” Department at IICT – BAS. Elena Lilkova's research activity is in the field of mathematical and physical modelling of biological macromolecules and complexes. In terms of methodology, Elena Lilkova's interests are focused on methods for accelerated traversal of the phase space, improvement of molecular dynamics calculations, methods for calculating free energies of biophysical processes and the potential of the finite element method for accelerating the modelling of proteins binding.

Publication, lecturing and expert activities, project participation

For participation in the concourse for promotion to the academic position “Associate Professor”, Elena Lilkova has presented **21 scientific publications**, of which **4 papers in journals with an impact factor**, **12 papers in journals with an SJR**, and **5 papers in international journals without an impact factor or an SJR**. In 6 of the publications presented for the concourse, Elena Lilkova is the first author, and in another 6 – the second author, and this fact irrefutably shows the **personal input of the candidate** in her research developments. I recognize all publications by Elena Lilkova, which have been presented for the concourse, as fully compliant with the requirements for proven excellence of the scientific publications, as well as strictly relevant to the thematic scope of the concourse.

In "4-spisak-publikatsii" the publications of Elena Lilkova are presented as follows: according to indicator B4 – 4 publications, including 2 with an impact factor and 2 with an SJR, and according to indicator G7 – 17 publications, including 2 with an impact factor, 10 with an SJR and 5 without an impact factor or an SJR. As a critical note, I would point out the absence in the submitted documents of an abstract of the PhD thesis for the acquisition of the PhD degree, or at least a list of publications related to its acquisition. I accept that the publications presented for the participation in the concourse competition do not repeat those submitted for the acquisition of the PhD degree, based on item 4 of Elena Lilkova's application for admission to participate in the concourse competition, signed by the candidate.

For participation in the concourse, a list of 26 citations of 8 publications ("5-citirania") is presented, but according to "1-prilojenieG" Elena Lilkova has 36 citations of 12 publications, with an h-index of 3 (according to Scopus). Elena Lilkova has also presented a list of 66 participations at international and national scientific forums ("1-prilojenieB").

According to "1-prilojenieV", Elena Lilkova participated in 15 projects, and in 2 of them – under the "Programme for supporting young scientists – BAS", she was the principal investigator. According to "10-prinosi", Elena Lilkova has "Participated in 16 scientific projects (4 with European and 12 with national funding ...)", while in "8-spravka-za-min-tochki-docent-4-5 -i-4-6" "Participation in a national scientific or educational project" (indicator E14, 10 items) as well as "Management of a national scientific or educational project" (indicator E16, 2 items) are reflected, but no "Participation in an international scientific or educational project" is reflected. According to "deklaracii_proekti_elena_lilkova", Elena Lilkova participated in 9 projects. Despite the discrepancy in the information in the various documents, I believe that Elena Lilkova meets the minimum requirements according to the Regulations for the implementation of the ADASRB in IICT – BAS.

In a tabular form, a report on the fulfilment of the minimum requirements, according to the Regulations for the implementation of the ADASRB in the IICT – BAS and for registration in the NACID, as well as the total number of points of the candidate Elena Lilkova, is presented.

Reference to the fulfilment of the minimum requirements

<i>Group of indicators</i>	<i>Minimum requirements IICT – BAS</i>	<i>Number of points by Elena Lilkova</i>	<i>For registration in the NACID</i>	<i>Number of points by Elena Lilkova</i>
<i>A</i>	50	50	50	50
<i>B</i>	-	-	-	-
<i>V</i>	100	110	100	165
<i>G</i>	260	300	200	450
<i>D</i>	70	156	50	208
<i>E</i>	20	143*	-	-
Total:	500	759	400	873

**Note: Possible different number of points due to the above reflected discrepancy in the information in the different documents.*

As can be seen from the table, Elena Lilkova fully meets and even surpasses the requirements for the academic position "Associate Professor" according to the Regulations for the implementation of the ADASRB in the IICT – BAS, as well as for registration in the NACID.

Elena Lilkova has also actively participated in the organization and holding of several specialized international and national scientific conferences in the country. Since 2018, she has also been in the editorial team for the publication of several volumes of Springer's series with an SJR.

All of the above presents the candidate in the concourse for promotion to the academic position "Associate Professor" Elena Lilkova as a fully competent specialist in the field of mathematical and physical modelling of biological macromolecules and complexes.

Analysis of the main fundamental and applied research contributions

Elena Lilkova has presented an author's reference with achieved results in the following 3 categories:

1. Molecular modelling of human interferon gamma, with results detailed in 4 subcategories, namely hIFN γ structure modelling, mutant forms, glycosylation and interaction with glycosaminoglycans.
2. Modelling of antimicrobial peptides, with detailed results presented in 3 subcategories, namely structure, behaviour and self-organization in solution and interaction with membranes.
3. Scientific software, with detailed results presented in 3 subcategories, namely analysis and testing of specialized applications and packages for high-performance calculations, as well as development of tools and methods for molecular modelling of biological systems.

In the presented "Author's reference for the original scientific and scientific-applied contributions of Senior Assist Prof. Elena Boyanova Lilkova, PhD" ("10-prinosi"), there are actually no defined "scientific and scientific-applied contributions". As a note, I would also mention the few unreadable characters in this document, which appear to be due to a technical rather than a substantive problem. Despite these facts, it should be noted that a detailed description of the obtained scientific results in the publications has been presented for the concourse, thus allowing qualitative assessment of the candidate's scientific research activity. I consider the scientific results presented by Elena Lilkova as original and reflecting her overall scientific research activity. I am convinced that they are of essential importance for the development of mathematical and physical modelling of biological macromolecules and complexes. The citability of Elena Lilkova's scientific works is yet another independent testimony of the quality of the excellent research results achieved with her active participation.

Personal impressions

I do not personally know Senior Assist Prof. Elena Lilkova, but based on the documents presented for the concourse for the academic position of "Associate Professor", I see a well-established specialist in a highly interdisciplinary field, with outstanding qualities for a promising career development.

Conclusion

In the formation of the final assessment of the candidate Elena Lilkova for promotion to the academic position "Associate Professor", the requirements of the ADASRB have to be taken into consideration, as well as the regulations for its implementation approved by the Council of Ministers, and BAS, and the specific regulations of IICT – BAS. With respect to the presented documents, Senior Assist. Prof. Elena Lilkova meets, and even surpasses, the requirements set for the academic position "Associate Professor".

On the basis of the presented concourse documents and the candidate's publications, which provide visibility of the obtained results, as well as on the basis of the notability of the scientific contributions included thereof, I take the liberty to recommend to the respected members of the Scientific Jury to propose to the Scientific Council of IICT – BAS to vote for the promotion of Senior Assist Prof. Elena Boyanova Lilkova, PhD to the academic position "Associate Professor" in Professional Field 4.5 Mathematics, Scientific Specialty Mathematical Modelling and Application of Mathematics (Applications in Computational Physics and Biology).

13 July 2022
Sofia

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