

## REVIEW

by Prof. D-r **Velina Todorova Slavova**, New Bulgarian University

in the competition for the scientific position of “**professor**” in New Bulgarian University

Scientific Field: **4. Natural Sciences, Mathematics and Informatics**,

Professional Field: **4.5. Mathematics**

announced in “**Darzhaven vestnik**” No **35/18.04.2023**

Candidates: **1) Assoc. Prof. Dr. Danail Stefanov Brezov**

**2) Assoc. Prof. Dr. Dimitar Vladislavov Atanasov**

### **I. Fulfillment of the minimal national requirements and the requirements of the New Bulgarian University**

#### **1) Assoc. Prof. Dr. Danail Stefanov Brezov**

Assoc. Prof. has obtained his PhD degree in 2015 for a thesis entitled “Vector parametrizations and factorizations in Euclidean and hyperbolic models in mechanics” in the Institute of mechanics of BAS. With this he covers the minimal requirements in group A.

Since in group C the candidate does not present a habilitation text he cover the necessary number of points in groups C with seven papers that give 276 points. The situation here is not quite clear since thre of the publications, namely these with numbers [14], [15] and [17] where used in a previous procedur in UACEG in 2019. These three papers give a total of 135 points so that the remaining 145 points are enough to statisfy the requirements in points C. Furthermore, the requirements in group D are covered again with scientific papers reviewed or indexed in some of the admissible scientific data bases. Again several papers turn out to have been used in athe previous procedure from 2019. These are the papers with numbers [26], [27], [28], [29], [32]. They give altogether 111 points so that I accept that the minimal requirements are satisfied also in group D, albeit with a smaller number of points than claimed.

In group E the candidate presents 29 citations that are worth 176 points while the required number is 100 points. Although some of the citations are not admissible (like citation 6 of the first paper in the lis which is a master’s thesis) I think that the candidate covers the minimal requirements in this group.

Group F deals with supervision of PhD students, participation in national and international scientific and educational projects, publication of university textbooks etc. Here, the candidate claims 220 points obtained from one PhD student, five national and two international projects, and three textbooks. I do not accept the PhD Consultancy since in 2017 the candidate is not an associate professor and formally cannot be a consultant. Moreover the PhD student already has a supervisor. Four of the five national projects are internal university projects that are not admissible; for the remaining two international project no persuasive evidence is given . Nevertheless the three electronic textbooks amount a total of 120 points that are enough to cover the required 100 points in this group.

I accept that the candidate covers the minimal requirements in groups G and H with the presented translations, his participation as a lecturer in the summer schools and his participation as a team leader in the students' olympiads in mathematics.

Since the candidate has not been an employee of the New Bulgarian University I think that the specific requirements in group I do not apply for him. **All in all, I think that Dr. Brezov fulfills the minimal national requirements for the academic degree of "full professor".**

## **2) Assoc. Prof. Dr. Dimitar Vladislavov Atanasov**

Dimitar Atanasov has obtained his PhD degree in 2008 for a PhD thesis entitled "Robust methods for scaling and pointwise estimation" in 2008. Thus the requirement in group A is covered.

In group C the candidate presents two papers in Q2. They give a total of 120 points that exceed the required 100 points for this group. In group D he presents a list of eight papers that give 267 points satisfying the requirement of 200 points. All these are written after 2020, i.e. the papers have not been used in his PhD thesis and his application for an associate professor in 2013.

In group E the candidate presents a list of 77 citations of his papers that give 616 points that exceed the required 100 points. I could not detect self-citations or other inconsistencies in this list. Even a lapse on my part would not change significantly this score. This is evidence that the scientific production of the candidate is well-known in the professional community.

In this group F the candidate presents evidence for participation in 11 national and five international projects. This gives a total of 270 points that cover the minimal requirements in this point. All these points point at a very intensive project activity of the applicant.

In groups G and I Dr. Atanasov claims 85 and 110 points, respectively. He has been an employee of the New Bulgarian University for more than 10 years. During these years he has had various administrative duties and has served on many panels and executive organs of the university: program council of department Informatics, the faculty council of the Master's faculty, the Academic council of the university. Since 2019 he has been serving as a chair of department "Informatics". **I conclude that Dr. Atanasov fulfills the minimal national requirements for the position of "full professor".**

## **II. Research activities**

### **1) Assoc. Prof. Dr. Danail Stefanov Brezov**

The research of Dr. Brezov is focused on investigations in the field of mechanics: the application of geometric models of low dimension for the solution of classes of kinematic problems, parametrization of three-dimensional euclidean rotations, based on a two-axes decompositions, generalization of classical results etc. He also investigates the problem of the decomposition of elements of  $SO(3)$  in a product of two rotations with given axes, which is important in the kinematics and dynamics of a solid body with a fixed point. Two of the papers (these with numbers [3] and [4]) deal with the application of statistical methods for the solution of practical problems. Paper [6] considers an interesting practical problem – the reconstruction of a picture given several partial images.

The candidate presents a list of 12 papers (one of which is only submitted for publication). These are published as follows:

Series in Knots and Everything (IF) – 1 paper  
Applied Sciences (IF) – 2 paper  
Environmental Research (IF) – 1 paper  
Advances in Applied Clifford Algebras (IF) – 4 paper  
Mathematical Methods in Applied Sciences (IF) – 1 paper  
Conference Proceedings – 2 paper

In four of these papers the candidate is the only author; two are with one co-author four are with two and one with six co-authors. I accept that in the joint publications the contribution of Dr. Brezov is equal to that of the other co-authors. These publications show the candidate as a serious researcher in the fields of mechanics and physics, and the related mathematical disciplines.

## **2) Assoc. Prof. Dr. Dimitar Vladislavov Atanasov**

The scientific interests of this candidate are in the field of stochastics and the application of various statistical methods for the solution of problems that are of great significance for the practice. The candidate has structured his results and contributions in the field in four main directions: (a) psychometric methods for the estimation of capabilities, (b) statistical estimation of the parameters of branching processes; (c) the use of statistical methods in various applications, (d) development of a specialized software for the implementation of various procedures for the estimation of the characteristics of text problems.

Group (a) includes papers [1,2,4,9,10]. They are devoted to the application of a special approach known as D-scoring for the evaluation of test problems and individual achievements. The performed investigations are used in the evaluation of the results in the national maturity exams in informatics in 2022.

Group (b) includes papers [3,5,7,8]. They are devoted to the investigation of the COVID-19 pandemic and use a new approach for the modelling of the number of infected individuals under the additional condition that the infected persons have not been registered.

Paper [6] can be attributed to group (c). It deals with a special investigation of the emotions related to the process of education in school.

Group (d) includes three software packages:

- Matlab package for D-scoring
- R-package for D-scoring
- Matlab package for simulation and estimation of branching stochastic processes

Altogether the candidate has presented a list of 10 papers that are published in scientific journals as follows:

- Applied mathematics (IF) -2 papers
- Comptes Rendus de l'Academie Bulgare des Sciences (IF) – 2 papers

- Interdisciplinary research (IF) – 1 papers
- Journal of Applied Statistics – 1 paper
- Psychological Thought – 1 paper
- Stochastics and Quality Control – 1 paper
- Measurement: Interdisciplinary Research and Perspectives - 1 paper
- Proc. Mathematics and Education in Mathematics – 1 paper

In four of the papers the candidate has one co-author, in six – two co-authors. As with the first candidate, I accept that the contribution of the candidate is equal to that of the other coauthors.

### **III. Teaching activities**

#### **1) Assoc. Prof. Dr. Danail Stefanov Brezov**

The candidate has very impressive teaching activities that are performed mostly at the UACEG. The tutorials and lectures held by the candidate cover a broad spectrum of fundamental mathematical disciplines: Analysis-1, Analysis-2, Linear algebra and analytical geometry, Descriptive geometry, Applied mathematics etc. He holds lectures in all these disciplines also in English.

Dr. Brezov has developed several new courses, among the “Mathematics and finance” and “Programming and algorithms with Python”. He is active working with distinguished students training them for the students’ olympiads in mathematics. Dr. Brezov has taken part as an organizer and lecturer in three international summer schools in mathematics

As a whole the teaching activities of Dr. Brezov are centered around more fundamental mathematical courses.

#### **2) Assoc. Prof. Dr. Dimitar Vladislavov Atanasov**

The teaching activities by Dr. Atanasov are performed almost exclusively at the New Bulgarian University. He teaches there plenty of courses among which I would stress GENB002A and GENB002B “Statistics”, PSYE107 “Statistics in the behavioral research”, CITB655 “Data Warehouse”, CITB502 “Game theory”, DSCM030 “Data theory”. Dr. Atanasov teaches all these courses also in English in the international programs of department “Informatics” of NBU. As whole his teaching load exceeds by far the average teaching load of a lecturer at the New Bulgarian University.

Dr. Atanasov has developed electronic materials for all his courses that are uploaded in university system MOODLE. He has served many times as the supervisor of students’ diploma theses, as a reviewer of such theses, as a member of various exam panels and as an examiner in the state exams.

The teaching of Dr. Atanasov is focused on courses in probability and statistics that have a bias towards applications. In the same time he is engaged with purely computer science courses. Many of the courses taught by him are interdisciplinary which covers the needs of other departments in NBU for mathematical courses.

### **IV. Administrative and community activities**

#### **1) Assoc. Prof. Dr. Danail Stefanov Brezov**

In the presented materials I could not find any evidence of administrative activities or administrative positions held by the candidate.

## **2) Assoc. Prof. Dr. Dimitar Vladislavov Atanasov**

Dr. Atanasov has held various administrative positions in different periods of his engagement at the New Bulgarian University. Dimitar Atanasov has served as a Director of the program “Informatics”, as a member of the faculty council of the Masters faculty, as well as a member of the Academic Council of the New Bulgarian University (up to this moment). Since 2019 Dr. Atanasov holds the position of a chair of department “Informatics”.

The candidate has taken part in several projects with non-governmental organizations (UNICEF).

## **V. Personal comments**

### **1) Assoc. Prof. Dr. Danail Stefanov Brezov**

I do not know personally Daniel Brezov and have no personal impressions of his scientific and teaching activities.

### **2) Assoc. Prof. Dr. Dimitar Vladislavov Atanasov**

I have known Dimitar Atanasov for more than ten years. I value very highly his professional qualities. He is a wonderful colleague and does an excellent job as a head of department “Informatics”.

## **VI. Critical remarks**

1) There are many contestable issues in the proofs presented by the first candidate. It remains unclear to me how can he participate with 18 publications in the procedure for associate professor at UACEG of which only 13 are contained in the list in NACID. This makes the check for the fulfillment of the minimal national requirements extremely difficult. The situation with the proofs for participation in national and international research projects is quite similar.

2) The amount and quality of scientific publications of both authors are approximately the same. The interests of Dr. Brezov lie in the field of mechanics and the related mathematical disciplines algebraic and differential geometry; the interests of Dr. Atanasov are in the field of stochastics and its various applications in other subjects (psychology, e-learning). This has to be assessed positively since it leads to interdisciplinary connections with other departments in NBU.

3) Both candidates give evidence for significant teaching activities. The courses taught by Dr. Brezov are fundamental mathematical courses (Analysis, Linear algebra, Analytical geometry), while these taught by Dr. Atanasov have more practical orientation. In addition, he has a far larger experience in teaching computer science courses. Both candidates show great devotion to the work with students: Dr. Brezov is engaged in the training of the teams for the students’ olympiads; Dr. Atanasov – in the supervision of diploma theses, participation in panels for different exams. It has to be noted that Dr. Atanasov is the supervisor of one PhD student in the PhD program of the New Bulgarian University, who is expected to defend his thesis shortly.

4) The New Bulgarian University does not have a program in Mathematics and the lectures in theoretical mathematical disciplines is strongly limited. A successful candidate is expected to cover many external services (teaching in other departments, mostly probability and statistics, as well as interdisciplinary courses). That is why I think the profile of the second candidate is more suitable for the New Bulgarian University.

## VII. Conclusion

The documents presented by the candidates give evidence that they are capable researchers and well-established lecturers covering a broad spectrum of disciplines. Both candidates are actively engaged with teaching at their universities. The lectures covered by assoc prof. Brezov are mostly theoretical and are related to mechanics and physics; the lectures held by assoc. prof. Atanasov are in their large part related to probability and statistics and their applications in various areas as psychology, e-learning etc.

Both candidates satisfy the minimal requirements of Law for promotion of the academic staff in the Republic of Bulgaria, and the specific additional requirements of the New Bulgarian University.

I assess positively both candidates and advise this Jury to propose both of them to the Academic Council of the New Bulgarian University for the position of full professor in the scientific field: 4. Natural Sciences, Mathematics and Informatics, professional field: 4.5. Mathematics.

I arrange them in descending order as follows:

- 1) Assoc. Prof Dr. Dimitar Vladislavov Atanasov
- 2) Assoc. Prof. Dr. Danail Stefanov Brezov

Sofia, 25.08.2023

Signature .....

(Prof. Velina Slavova)