

REPORT

to occupy the academic position:

"Professor"	
"Associate Professor"	X
	one of the academic positions indicated shall be marked with the sign "X"

Candidates to occupy the position:

1	Ch. assistant	Dr. Eng.	Vladislava	Hristova	Ivanova	UCTM-Sofia
№	academic position	scientific degree	name	middle name	last name	workplace

Scientific area:

4	Natural sciences, mathematics and computer science
code	name

Professional area:

4.1	Physical sciences
code	name

Scientific specialty:

Condensed Matter Physics with French

The competition has been announced:

number 102	03.12.2024	Physics	
in SG issue	date	for the needs of the Department	Faculty

The report was written by:

Prof.	Dr.Eng.	Dimitre	Zahariev	Dimitrov	ISSP-BAS
academic position	scientific degree	name	middle name	last name	workplace

1. Report for the candidate:

Ch. assistant	Dr.Eng.	Vladislava	Hristova	Ivanova
academic position	scientific degree	name	middle name	last name

1.1. Meeting the minimum requirements under the Regulations:

A) The candidate meets the minimum requirements	20 points	X
B) The candidate doesn't meet the minimum requirements	0 points	
		one of the answers given is marked with the sign "X"

It must be filled in if answer B is marked. The publication activity of the candidate is analyzed. The response of the results achieved (quoted) is analyzed.

1.2. Relevance of scientific and / or applied research:

A) The research is relevant. Part of the research is pioneering (no results are known on the topic by other authors)	8 points	X
B) Research is relevant. Results from other authors are known for each of the topics and / or applications studied.	6 points	
C) Most of the research is relevant, but also some results are presented that have no scientific and / or applied value	4 points	
D) The smaller part of the research is relevant	2 points	
E) Research is not relevant	0 points	
		one of the answers given is marked with the sign "X"

The evaluation of the relevance of the research must be substantiated.
Te-containing bulk glasses and thin films of the Ge-Te-In system are promising materials for application in optoelectronic devices.

1.3. Objectives of the research:

A) Realistic and of scientific and / or applied interest	8 points	X
B) Realistic, but not of scientific and / or applied interest	4 points	

C) Unattainable (unrealistic)	0 points	
		one of the answers given is marked with the sign "X"

Objectives must be specified. The type of the set objectives must be justified
The goals of the dissertation work are to obtain and study Te-containing bulk glasses and thin films of the Ge-Te-In system and to study their possible application in optoelectronics. The goals set are of a scientific-applied nature originating from the tasks set and the results obtained.

1.4. Candidate research contributions:

A) With lasting scientific and / or applied response, they form the basis for new research and applications	20 points	
B) They are of significant scientific and / or applied interest, complete and / or summarize previous research	16 points	X
C) They are of scientific and / or applied interest	12 points	
D) Lack of significant contributions	8 points	
E) Lack of contributions	0 points	
		one of the answers given is marked with the sign "X"

Contributions must be specified. The type of results achieved must be justified.
The contributions are of a scientific and applied nature. Bulk samples and thin films of chalcogenide materials have been obtained. For the first time, the structure of chalcogenide glasses with the composition $(\text{GeTe}_y)_{100-x}\text{In}_x$ has been studied using atomic models containing up to 300 atoms, through simulations using ab initio molecular dynamics (AIMD) and density functional theory (DFT) (publications A1, A12). Calculations performed with the SIESTA program (publication A1) show that amorphous Ge–Te–In has a significant number of four-fold rings, which are responsible for the rapid crystal growth during the transition from the crystalline to the amorphous state. The results of ab initio simulations show that the crystallization of samples with 80–100 atoms occurs in hundreds of picoseconds, making them suitable for phase change materials. For the first time, photoinduced changes in thin films of the Ge-Te-In system have been established, expressed in a shift of the absorption edge, a change in the refractive index and the optical band gap.

1.5. Participation of the candidate in the achievement of the presented results:

A) The candidate has at least an equal participation in the submitted papers	8 points	X
B) The candidate has at least an equal participation in most of the submitted papers	7 points	
C) The candidate has a secondary participation in most of the submitted papers	4 points	
D) The candidate participation is unnoticeable	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the items C or D is marked.

1.6 Pedagogical activity:

A) The candidate has effective and sufficient pedagogical activity at the university. The textbooks issued are modern and useful (they meet the requirements of the Regulations). The work with undergraduate and doctoral students is at a high professional level.	8 points	
B) The candidate has sufficient pedagogical activity at the university. The textbooks issued satisfy the requirements of the Regulations.	6 points	X
C) The pedagogical activity and / or textbooks issued are insufficient (do not meet the requirements of the Regulations)	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the items B or C is marked.

1.7. Critical notes:

A) Lack of critical notes	8 points	X
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B) Critical notes of a technical nature	7 points	
C) Critical notes that would partially improve the results achieved in a small part of the research	5 points	
D) Critical notes that would partially improve the results achieved in most of the research	3 points	
E) Significant critical notes	0 points	
		one of the answers given is marked with the sign "X"

Critical notes must be provided if one of the answers C, D or E is marked.

1.8. Conclusion

A) The evaluation of the candidate's activity is POSITIVE	This evaluation is assigned to a total number of at least 50 points	X
B) The evaluation of the candidate's activity is NEGATIVE	This evaluation is assigned to a total number below 50 points	
		one of the answers given is marked with the sign "X"

To be filled in if requested by the member of the scientific jury

31.03.2025	The report was written by:	
date	Dimitre Dimitrov	signature