

STATEMENT

for principal assistant Vladimir Veselinov Bozhilov, PhD, candidate in the competition for the academic position "Associate Professor" in the professional field 4.1 Physical sciences (Astronomy and Astrophysics) announced by the Sofia University „Saint Kliment Ohridski“ in the GN number 54, 29 June 2021

by professor Radoslav Kostadinov Zamanov, DSc – Institute of Astronomy and National Astronomical Observatory, Bulgarian Academy of Sciences

Vladimir Bozhilov obtained bachelor degree (2004-2008) and later graduated as Master of Sciences (2008-2009) in the Sofia University „Saint Kliment Ohridski“. He was PhD student in the Department of Astronomy, Faculty of Physics during the period 2010-2014. In 2014, he defended PhD thesis „Polarimetric and photometric study of blazars“ and obtained the educational and scientific degree Philosophy Doctor. From 2015 till now is principal assistant in the Department of Astronomy.

He has taught lectures and exercises in Astrophysics, Astronomical photometry, History of Astronomy, Cosmology, Variable stars, Communication of Astronomy, Solar system, extrasolar planets and the search for extraterrestrial life. He supervised 13 students for bachelor and master degrees.

He participated in international schools for young astronomers in Greece, Finland, Vaticana, Turkey. He is member of the branch Cosmos of the Union of the Physicists in Bulgaria, member of the European Astronomical Society (EAS), and of the International Astronomical Union.

Dr. Vladimir Bozhilov is the manager of the project „Space Education for Bulgaria“ for development of contemporary university lectures financed by the European Space Agency. V. Bozhilov is founder and coordinator of the Planetarium of the Children`s Museum „Muzeiko“ (2015-2019), scientific editor of the BBC Knowledge magazine (2014-2018). He is one of the national contact points of the European Research Council for „Horizon Europe“ the EU`s key funding programme for research and innovation.

He has significant media experience - more than 300 participations in radio and TV broadcastings in the fields of Cosmos and astronomy.

V. Bozhilov is author of two books "Живот и Вселена" (Live and the Universe), V. Bozhilov and K. Nam, ISBN: 978-954-92111-7-7, MAGOART, Sofia, 2010 and "Археологика I: Евристичен Подход към Свещените символи и знания", книга, част първа, Хр. Смоленов, Хр. Михайлов и В. Божилков, ISBN: 978-954-92111-4-6, MAGOART, Sofia, 2009. He has translated and edited 10 popular science books.

V. Bozhilov presented a list containing 48 publications. The Astrophysics Data System NASA-ADS gives for him 40 publications, including 19 refereed papers, 3 publications and one preprint where he is the first author. The publications can be separated in the following groups:

- 15 publications in the best (Q1) international scientific journals (MNRAS, Astronomy & Astrophysics, JCAP, Astrophysical Journal) having impact factor more than 4.0, including one in the top journal Nature.
- 3 publications in very good (Q2) international scientific journals.
- 8 in other international scientific journals.
- 3 in proceedings of conferences.
- more than 15 other scientific publications

The research and the activity of the candidate are in a few directions: (1) study of Active galactic nuclei and blazars; (2) observations and analysis of variability in the optical wavelengths, radio, ultraviolet, X-ray and gamma-rays, polarimetric observations; (3) study of the variability of the emission of super massive black holes; (4) extraterrestrial life and the Universe; (5) astronomy and physics education.

Among his publications, I want to note:

“The entropy principle, and the influence of sociological pressures on SETI”, published in 2010, International Journal of Astrobiology, 9, 175 [journal in category Q2], in which is studied the law of entropy and its significance for the evolution of intelligent life and the advent of technological civilization.

The study is on the basis of a modern approach to evolutionary theory with Monte Carlo realization techniques and numerical tests.

“Investigating the multiwavelength behaviour of the flat spectrum radio quasar CTA 102 during 2013-2017“, [2016 MNRAS 461, 3047, cited 43]. In this work are presented observations of the flat spectrum radio quasar CTA 102 in broad wavelength range. The data include Whole Earth Blazar Telescope, the Owens Valley Radio Observatory, the Atacama Large Millimeter Array, infrared data from Rapid Eye Monitor telescope, the satellite Swift (ultraviolet and X-ray data), the satellite Fermi (gamma rays). In this papers is also studied the flux and spectral variability and the correlation between flux changes at different wavelengths. γ -ray flaring activity is observed during 2016 November-2017 February. The γ -ray/optical relationship is interpreted with a geometrical model suggesting that the long-term flux variations are mainly due to changes in the Doppler factor produced by variations of the viewing angle of the emitting regions.

„Dissecting the long-term emission behaviour of the BL Lac object Mrk 421“, [2017, MNRAS 472, 3789, cited: 21]. In this work is presented a long-term multiwavelength monitoring of blazar Mrk 421 in the period 2007-2015, characterized by several extreme flares. It is demonstrated that the ratio between the optical, X-ray and γ -ray fluxes is very variable. The γ -ray flux shows a correlation with the optical ones starting from 2012. The spectropolarimetry shows wavelength-dependence of the polarization degree, and no wavelength dependence of the electric vector polarization angle. The broad-band spectral energy distributions is built from near-infrared to the ultraviolet and X-ray ranges. The interpretation is with jet models including two emitting regions, which can change their orientation.

Citations: following the list of citations given by the applicant, his publications have in total 206 citations from authors that are no co-authors of the cited paper. Most of the citations are in leading astronomical journals MNRAS, Astronomy & Astrophysics, Astrophysical Journal, etc. In his application he has given H-index=9 (Scopus.com). Following NASA-ADS his H-index=11 (NASA-ADS is more complete for astronomical papers).

Critical remarks: V. Bozhilov has few papers as first author – 1 publication in Q1 journal, one in Q2 journal, one in Q4 journal. In NASA-ADS, I can not find any publication, in which he is the first author during the last 5 years. He has selected as equivalent to habilitation, publications with more than 30 authors, where he is not even among the first three authors. It is strange for me.

My opinion is that the candidate fulfills the national requirements in the professional filed. His publications are based on unique observational data and I do not find plagiarism in his scientific papers. The fact that he has only few papers as first author is compensated by the facts that he is author of two books, his high H-index, his participation in projects and international collaborations, and the number of the students supervised.

On the basis of his activity (as an university lecturer, as a promoter of science, as a coordinator), published scientific papers, citations of these papers, I give positive evaluation and recommend to the Faculty Council of the Faculty of Physics of the Sofia University „Saint Kliment Ohridski“ to elect **Vladimir Veselinov Bozhilov for the academic position "Associate Professor"**.

21 October 2021

Sofia

prof. Radoslav K. Zamanov