

## Assoc. Prof. Daniela Avetisyan, PhD

davetisyan@space.bas.bg



Associate Professor Daniela Avetisyan graduated from the Faculty of Geology and Geography of the Sofia University "St. Kliment Ohridski" with a bachelor's degree in Geography in 2010 and a master's degree in Physical Geography and Landscape Ecology in 2012. In 2018, she defended her doctoral degree with a dissertation on the topic "Study of Dynamics and Development of Degradation Processes Leading to Desertification Using Remote Sensing and GIS".

From 2013 to 2022, she worked successively as an ecologist, assistant, and postdoctoral researcher in the Aerospace Information Department at SRTI-BAS. The topic of her postdoctoral project was "Application of Remote sensing and GIS for Assessment of Ecological Sustainability and Functioning of Selected Agro-ecosystems in Changing Environmental Conditions". Since 2022, she has held the academic position of associate professor. In the same year, she was elected head of the department.

The scientific interests of Associate Professor Daniela Avetisyan are related to the application of aerospace information, remote sensing methods, and computer modeling to study the effects of climate change and anthropogenic activity on terrestrial ecosystems.

Dr. Avetisyan participated in a number of research projects related to the inventory of natural disturbances in forests, determination of the predicted status of ecosystem services in conditions of a changing natural environment, application of radar and optical satellite data for soil studies, determination of landscapes regulation capacity and their role in the prevention of catastrophic events, tracking the state and dynamics of snow cover in conditions of climate change, etc.

Dr. Avetisyan has been honored with a number of awards, including an award for an independent scientific work of a young scientist in the area of natural and mathematical sciences named after Professor Lotfi Zadeh in 2021. In 2019, she was honored with the "Professor Marin Drinov" award for a young scientist of the BAS for achievements in the scientific field "Astronomy, Space research, and Technologies".

Daniela Avetisyan is an author and co-author in more than 30 scientific publications.

## Management and participation in projects in the last five years

1. № КП-06-M64/1 (2022-2024) “Monitoring seasonal dynamics and stability of the snow cover in the mountain belt of the Republic of Bulgaria for a period of 10 years (2014-2024) using Remote sensing”. Funding institution: The Ministry of Education and Science of Bulgaria, Bulgarian National Science Fund.
2. № 70-25-59/10.08.2022 (2022-2023) DEADDSP “Destination Earth Antarctica – Digital Data Space, Pilot Project”. Funding institution: The National Centre for Polar Studies at Sofia University "St. Kliment Ohridski".
3. № 4000134290/21/NL/CBi (2021-2023) FoReS „Forest Disturbance Inventory Using Remote Sensing“. Funding institution: The European Space Agency.
4. № ПМС 203/19.09.2018 (2019-2021) “Application of Remote sensing and GIS for Assessment of Ecological Sustainability and Functioning of Selected Agro-ecosystems in Changing Environmental Conditions”. Funding institution: The National Programme "Young scientists and postdoctoral researchers - 2", The Ministry of Education and Science of Bulgaria.
5. № ДФНП -17-42/26.07.17 (2017-2019) “Application of Remote Sensing and GIS for Determination of Predicted Status of the Ecosystem/Landscape Services in Changing Environmental Conditions”. Funding institution: The Ministry of Education and Science of Bulgaria.

## Scientific publications in issues referenced and indexed by WoS or Scopus

1. **Daniela Avetisyan**, Andrey Stoyanov, "Assessment of elevation and slope exposure impact on snow cover distribution in the mountainous region in Bulgaria using Sentinel-2 satellite data," Proc. SPIE 12727, Remote Sensing for Agriculture, Ecosystems, and Hydrology XXV, 127271H (17 October 2023); doi: 10.1117/12.2679770
2. Andrey Stoyanov, **Daniela Avetisyan**, "Application of optical data from Sentinel-2-MSI for snow cover monitoring on the territory of the mountainous region of Bulgaria," Proc. SPIE 12727, Remote Sensing for Agriculture, Ecosystems, and Hydrology XXV, 127271I (17 October 2023); doi:10.1117/12.2679774
3. Temenuzhka Spasova, Adlin Dancheva, **Daniela Avetisyan**, Iva Ivanova, Iliyan Popov, Boris Shirov, "Monitoring of renewable energy sources with remote sensing, open data, and field data in Bulgaria," Proc. SPIE 12733, Image and Signal Processing for Remote Sensing XXIX, 1273311 (19 October 2023); doi: 10.1117/12.2680495
4. Maria Dimitrova, Plamen Trenchev, **Daniela Avetisyan**, "Spatiotemporal behavior of atmospheric pollutant ingredients over Bulgaria, based on open access GAMS data," Proc. SPIE 12730, Remote Sensing of Clouds and the Atmosphere XXVIII, 127300R (19 October 2023); doi: 10.1117/12.2684037
5. Galina Cherneva, Valentina Hristova, Denitsa Borisova, Anna Bouzekova-Penkova, **Daniela Avetisyan**, "Compensation of linear distortions in case of transmitting measurement information," Proc. SPIE 12734, Earth Resources and Environmental Remote Sensing/GIS Applications XIV, 127341G (19 October 2023); doi: 10.1117/12.2680510
6. Nataliya Stankova, **Daniela Avetisyan**, "Modeling post-fire forest regrowth using tasseled cap-derived indicators," Proc. SPIE 12734, Earth Resources and Environmental Remote Sensing/GIS Applications XIV, 1273419 (19 October 2023); doi: 10.1117/12.2679783
7. Plamen Trenchev, Maria Dimitrova, **Daniela Avetisyan**, "Determining background concentrations of major atmospheric pollutants using Sentinel-5P TROPOMI data," Proc. SPIE 12730, Remote Sensing of Clouds and the Atmosphere XXVIII, 127300Q (19 October 2023); doi: 10.1117/12.2679839
8. Temenuzhka Spasova, **Daniela Avetisyan**, "A synchronized remote sensing monitoring approach in the Livingstone island region of Antarctica," Proc. SPIE 12786, Ninth International Conference on Remote Sensing and Geoinformation of the Environment (RSCy2023), 127861X (21 September 2023); doi: 10.1117/12.2682162
9. Plamen Trenchev, Maria Dimitrova, **Daniela Avetisyan**, Temenuzhka Spasova, "A fast and efficient method for calculation of background methane concentrations using Sentinel-5P satellite data," Proc. SPIE 12786, Ninth International Conference on Remote Sensing and Geoinformation of the Environment (RSCy2023), 1278624 (21 September 2023); doi: 10.1117/12.2681793
10. Maria Dimitrova, Plamen Trenchev, **Daniela Avetisyan**, Temenuzhka Spasova, "Spatio-temporal monitoring of air pollution over Bulgaria's largest industrial area using Sentinel-5p TROPOMI data," Proc. SPIE 12786, Ninth International Conference

on Remote Sensing and Geoinformation of the Environment (RSCy2023), 127861P (21 September 2023); doi:10.1117/12.2681792

11. **Avetisyan, D.**; Stankova, N.; Dimitrov, Z. Assessment of Spectral Vegetation Indices Performance for Post-Fire Monitoring of Different Forest Environments. *Fire* 2023, 6, 290. <https://doi.org/10.3390/fire6080290>
12. Trenchev, P.; Dimitrova, M.; **Avetisyan, D.** Huge CH<sub>4</sub>, NO<sub>2</sub> and CO Emissions from Coal Mines in the Kuznetsk Basin (Russia) Detected by Sentinel-5P. *Remote Sens.* 2023, 15, 1590. <https://doi.org/10.3390/rs15061590>
13. **Avetisyan, D.**; Velizarova, E.; Filchev, L. Post-Fire Forest Vegetation State Monitoring through Satellite Remote Sensing and In Situ Data. *Remote Sens.* 2022, 14, 6266. <https://doi.org/10.3390/rs14246266>
14. **Avetisyan, D.** & Cvetanova, G. (2022). Assessment of drought impact on phenological development of selected sunflower hybrids based on vegetation indices and orthogonalization of multispectral satellite data. *Bulg. J. Agric. Sci.*, 28 (6), 1006–1026
15. **Avetisyan, D.**, Borisova, D., Velizarova, E.. Integrated evaluation of vegetation drought stress through satellite remote sensing. *Forests*, 12, 8, MDPI AG, 2021, ISSN:1999-4907, DOI:10.3390/f12080974,
16. **Avetisyan, D.**, Bilyana, B., Nedkov, R.. Determination of the Landscapes Regulation Capacity and Their Role in the Prevention of Catastrophic Events: A Case Study from the Lom River Upper Valley, Bulgaria. *Challenges and Perspectives in Southeastern Europe*, Springer, 2016, DOI:10.1007/978-3-319-27905-3\_13, 173-190.
17. **Avetisyan, D.**. A satellite-based modified plant senescence reflectance index for green-water drought monitoring. *Proc. SPIE 11863, Earth Resources and Environmental Remote Sensing/GIS Applications XII*, 1186318, 2021, DOI:doi.org/10.1117/12.2599676, 1186318-1-1186318-11.
18. **Avetisyan, D.**, Cvetanova G.. Spectral signature profiles of winter wheat in different growth stages under various environmental conditions. *Proc. SPIE 11856, Remote Sensing for Agriculture, Ecosystems, and Hydrology XXIII*, 11856, 2021, DOI:doi.org/10.1117/12.2599674, 118561A-1-118561A-10.
19. Nedkov, R., Velizarova, E., **Avetisyan, D.**, Georgiev, N.. Assessment of forest vegetation state through remote sensing in response to fire impact. *Proc. SPIE 11524, Eighth International Conference on Remote Sensing and Geoinformation of the Environment (RSCy2020)*, 11524, Society of Photo-Optical Instrumentation Engineers (SPIE), 2020, ISSN:0277-786X, DOI: <https://doi.org/10.1117/12.2570808>.
20. **Avetisyan, D.**, Nedkov, R.. Monitoring the dynamics of phenological development of winter wheat using orthogonalization of multispectral satellite data. *Proc. SPIE 11528, Remote Sensing for Agriculture, Ecosystems, and Hydrology XXIII*, 115280, XXII, Society of Photo-Optical Instrumentation Engineers (SPIE), 2020, ISSN:0277-786X, DOI: <https://doi.org/10.1117/12.2573274>, 115280Y-1-115280Y-10.
21. **Avetisyan, D.**, Nedkov, R., Georgiev, N.. Monitoring maize (*Zea Mays* L.) phenology response to water deficit using Sentinel-2 multispectral data. *Proc. SPIE 11524*,

Eighth International Conference on Remote Sensing and Geoinformation of the Environment (RSCy2020), 11524, Society of Photo-Optical Instrumentation Engineers (SPIE), 2020,

ISSN:0277-786X, DOI: <https://doi.org/10.1117/12.2570734>.

22. Velizarova, E., Nedkov, R., **Avetisyan, D.**, Radeva, K., Stoyanov, A., Georgiev, N., Gigova, I.. Application of remote sensing techniques for monitoring of the climatic parameters in forest fire vulnerable regions in Bulgaria. Proc. SPIE 11174, Seventh International Conference on Remote Sensing and Geoinformation of the Environment (RSCy2019), 11174, SPIE, 2019, DOI:10.1117/12.2533656, 111740E-1-111740E-12
23. Kazaryan, M., Shakhramanyan, M., Nedkov, R., Borisova, D., **Avetisyan, D.** Fractal presentation of space images during waste disposal sites monitoring. Proc. SPIE 11174, Seventh International Conference on Remote Sensing and Geoinformation of the Environment (RSCy2019), 11174, SPIE, 2019, ISSN:0277-786X, DOI:10.1117/12.2532890, 1117410-1-1117410-7.
24. Borisova, D., Goranova, M., Hristova, V., **Avetisyan, D.**, Kisyov, A.. Spectral and petrophysical data for filling in thematic database in Earth observation over test site. Proc. SPIE 11174, Seventh International Conference on Remote Sensing and Geoinformation of the Environment (RSCy2019), 11174, SPIE, 2019, ISSN:0277-786X, DOI:10.1117/12.2533480, 111740A-1-111740A-8.
25. **Avetisyan, D.**, Nedkov, R.. Application of remote sensing and GIS for determination of predicted status of the ecosystem/landscape services in changing environmental conditions. Proc. SPIE, 11174, , Seventh International Conference on Remote Sensing and Geoinformation of the Environment (RSCy2019)111740I, SPIE, 2019, DOI:10.1117/12.2532609, 111740I-1-111740I-10.
26. **Avetisyan, D.**, Nedkov, R., Borisova, D., Cvetanova, G.. Application of spectral indices and spectral transformation methods for assessment of winter wheat state and functioning. Proc. SPIE 11149, Remote Sensing for Agriculture, Ecosystems, and Hydrology XXI, 11149, 2019, ISSN:0277-786X, DOI:10.1117/12.2538117, 1114929-1-1114929-10.
27. Stankova, N., Nedkov, R., Ivanova, I., **Avetisyan, D.** Modeling of forest ecosystems recovery after fire based on orthogonalization of multispectral satellite data. Proc. SPIE 10790, Earth Resources and Environmental Remote Sensing/GIS Applications IX, 10790, SPIE, 2018, DOI:10.1117/12.2325643, 107901R-1-107901R-7.
28. Borisova, D., Petkov, D., Nedkov, R., Nikolov, H., Dimitrov, V., Goranova, M., **Avetisyan, D.**, Radeva, K.. Remote sensing measurements in creating thematic spectral library. Proc. SPIE 10773, Sixth International Conference on Remote Sensing and Geoinformation of the Environment (RSCy2018), 10773, SPIE, 2018, ISSN:0277-786X, DOI:10.1117/12.2326005, 107730D-1-107730D-7.
29. **Avetisyan, D.**, Velizarova, E., Nedkov, R., Borisova, D.. Assessment and mapping of the current state of the landscapes in Haskovo region (Southeastern Bulgaria) in relation to ecosystem services using remote sensing and GIS. Proc. SPIE 10773, Sixth International Conference on Remote Sensing and Geoinformation of the

Environment (RSCy2018), 10773, SPIE, 2018, ISSN:0277-786X,  
DOI:10.1117/12.2325894, 107731P-1-107731P-9.

30. **Avetisyan, D.**, Nedkov, R.. Modification in landscape horizontal structure, induced by changing environmental conditions: a case study of Haskovo region (Southeastern Bulgaria). Proc. SPIE 10790, Earth Resources and Environmental Remote Sensing/GIS Applications IX, 10790, SPIE, 2018, ISSN:0277-786X, DOI:10.1117/12.2325398, 107901K-1-107901K-10.