# IAG Webinar – Eastern Europe

7 March 2024 at 12:00–14:30 CET

Coordinators: Anita Bernatek-Jakiel*, Mihai Micu**, Florin Tatui***
*Jagiellonian University, **Romanian Academy, ***University of Bucharest

INTERNATIONAL GEOMORPHOLOGY WEEK 2024

12:10–12:30

## Genesis and evolution of the Burgas shore, Southern Bulgarian Black Sea coast

*Nadezhda Dimitrova, Sofia University St. Kliment Ohridski, Bulgaria*

The Burgas beach is very recently formed due to the last century's constructions of coastal facilities, e.g. harbor, groynes, which accelerated the accumulation of sandspits and alternate the dynamics of the wave activity. Our work is focused on monitoring of seasonal fluctuations of the Burgas beach profile and determining tendencies in shore evolution. Regarding the sea level rice trends and the coast subsidence, established for this region, Southern Bulgarian sea coast could provide surprising local differences in coastal accumulation processes.

12:30–12:50

## Analysis of floodplain forms using LiDAR datasets

*Boglárka Bertalan-Balázs, University of Debrecen, Hungary*

LiDAR datasets have a great opportunity to classify floodplain forms. The main objective of our research was to identify a variety of floodplain forms along an oxbow lake of a meandering river in Hungary. We applied both point cloud-based and DTM-based approaches for the semantic segmentation of topography. We derived 60 geomorphometric variables from the DTM and prepared a geomorphological map of 265 forms (crevasse channels, point bars, swales, and levees). Random Forest classification was employed to reveal the most affecting factors in this type of geomorphologic mapping.

12:50–13:10

## Numerical modeling of deep-seated gravitational slope deformations in Velka Fatra Mts., Slovakia

*Andrius Toločka, University of Ostrava, Czechia*

Deep-seated gravitational slope deformations (DSGSDs) are common but not highly investigated phenomena around the world. Two DSGSD-affected slopes on the NE side of Velka Fatra Mts. (Slovakia) have been subjected to a detailed investigation, i.e. geomorphic mapping, remote sensing, structural data collection and numerical modeling. To improve understanding of these gravity-induced processes, we performed a back-analysis of collapsed DSGSDs through a finite-element model set up using the RS2 code. The numerical modeling approach and performed back-analysis enabled a better view of the development of these slope failures. It suggests a high diversity of mechanisms leading to the origin of these DSGSDs.

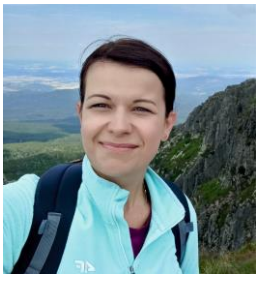
13:10–13:30

## Rock slope failures in Rodna Mountains, Northern Romanian Carpathians

*Anișoara Filip, Ștefan cel Mare University, Romania*

Rock slope failures (RSFs) are commonly found throughout the high belt of mountain ranges, especially the formerly glaciated ones. The present contribution presents the results of a systematic inventory of RSFs in the Rodna Mountains (Northern Romanian Carpathians) which totals over 150 significant affected areas. GIS-based geomorphological mapping reveals multiple types of RSFs (rockslides, rock avalanches, failed plateaus and saddles, and RSDs, with frequent splitting ridges, antiscarps, and other indicators) and evaluates the spatial incidence of all modes of RSF, with consideration for influential factors, such as geological aspects and paleoenvironmental evolution of the region.

13:30–13:50



## Lithological and structural features of tors development in Western Sudetes, Poland

*Aleksandra Michniewicz, University of Wrocław, Poland*

The Western Sudetes (SW Poland) are renowned for the frequent occurrence of tors characterized by a variable geological structure and morphology. Morphology and origin of tors was of research interest in the past, but despite detailed descriptions of the origins of these landforms, the studies to date were primarily based on qualitative observation or were not described comprehensively. Availability of new spatial data and tools allowed one to consider again the significance of tors in the landscape evolution. The main aim of the study was to provide the characteristics of tors and to identify factors behind their occurrence and evolution.

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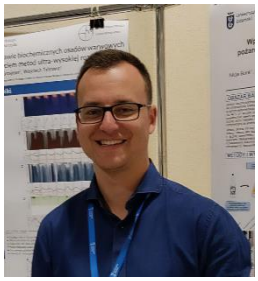
## Permafrost characteristics in marginal periglacial environment of Southern Carpathians

*Florina-Minodora Ardelean, West University of Timișoara, Romania*

This study provides a concise overview of the current understanding of permafrost characteristics in the Southern Carpathians. The occurrence of permafrost in the Southern Carpathians is closely linked to rock glaciers, which serve as crucial components for storing and transporting sediments in the periglacial environment. The majority of the rock glaciers in the Romanian Carpathians are relict, but several landforms are slowly moving with few centimeters per year due to the thin layers of permanently frozen ground. The occurrence of permafrost is constrained to specific sites where local topo-climatic factors and surface characteristics favor permafrost preservation. In the study area permafrost is found primarily in locations characterized by coarse openwork debris, reduced solar radiation exposure, and high elevations (> 2000 m). The distribution of permanently frozen deposits is patchy due to small-scale variability in controlling topo-climatic factors.

14:10–14:30

## A novel perspective on the American Southwest hydroclimate over the last 130,000 years: a high-resolution, hyperspectral record of aquatic productivity and lake level changes from Stoneman Lake (Arizona)



*Maurycy Żarczyński; University of Gdansk, Faculty of Oceanography and Geography, Gdansk, Poland and Northern Arizona University, School of Earth and Sustainability, Flagstaff, United States*

Our study explores the hydroclimate history of northern Arizona with Stoneman Lake's sedimentary archive spanning the glacial-interglacial cycle over 130,000 years. Using non-destructive hyperspectral imaging (HSI), we reconstructed primary production and dust deposition changes influenced by past hydroclimate shifts. HSI provided continuous, high-resolution records of sedimentary pigments and mineral matter proxies. Our dataset revealed that during colder and wetter marine isotope stages (MIS 4 and 2), the lake accumulated more organic matter, while warmer and drier stages (MIS5, MIS3, and MIS1) saw sedimentation dominated by allochthonous mineral matter. This study highlights HSI's potential for accurate limnogeological interpretation across glacial-interglacial cycles.