

**11th International Conference
“Modern trends in science”
FMNS-2025**

BOOK OF ABSTRACTS



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Assist. Prof. Dr. Neda Neykova – Czech Technical University, Czech Republic

Conference Program

Registration (11.06.2025)

13:00 – 18:30

University Conference Centre “Bachinovo”

Opening Ceremony (12.06.2025)

10:00 – 10:30

Central Auditorium of the Conference Center

Plenary Lectures (12.06.2025)

Central Auditorium of the Conference Center

10:30 – 11:10

**Prof. DSc Peter Boyvalenkov, Institute of Mathematics and Informatics,
Bulgarian Academy of Sciences**

"Polarization of spherical codes and designs"

11:10 – 11:50

Prof. Vesna Stankov Jovanović, PhD, University of Niš

"Advancements in Sample Preparation Techniques for the Analysis of
Persistent Organic Pollutants: A Focus on PAHs"

11:50 – 12:30

Assoc. prof. António Domingos, PhD, Universidade Nova de Lisboa

"What is the professional
knowledge of teachers to integrate STEM into their teaching practices?"

**Group photo - in front of the central entrance of the educational center of
South-West University - "Bachinovo"**

12.06.2025

12:30

Plenary Lectures (13.06.2025)

Central Auditorium of the Conference Center

10:30 – 11:10

**Assoc. prof. Sanka Velichkova Gateva-Kostova, PhD, Institute of Electronics,
Bulgarian Academy of Sciences**

"Coherent Magneto-Optical Resonances in alkali atoms and their applications"

11:10 – 11:50

**Prof. Stoyan Nedkov, PhD, National Institute of Geophysics, Geodesy and
Geography, Bulgarian Academy of Sciences**

**"Mapping of ecosystem services and the transformative change of the
European environmental policy"**

11:50 – 12:30

Prof. Krasimir Manev, PhD, New Bulgarian University

„Mathematics in the early education of programmers"

Sessions

12.06.2025 and 13.06.2025

13:30 – 15:30 and 16:00 – 18:00

University Conference Center "Bachinovo"

Poster sessions

12.06.2025 and 13.06.2025

18:00 – 19:30

Special session

Conference Hall

***“Challenges and Opportunities for Implementing STEM Approaches in
Secondary and Higher Education”***

14.06.2025

10:00 – 12:00

Welcome Party

12.06.2025

18:00 - 20:00

University Conference Center “Bachinovo”

Official dinner

13.06.2025

20:00

University Conference Center “Bachinovo”

Social program

14.06.2025

09:30 – 14:00

Section: Chemistry

Hall 4

Thursday, June 12 th	
Chairman: Assoc. Prof. Mitko Stoev	
13:30-13:45	O-C-1 Chemical composition of underground waters as a tool for finding connections between caves (applied for Nanzheng area, Shaanxi province, Central China) <i>David Havlíček, Michal Filippi, Zdeněk Motyčka, Kateřina Havlíčková</i>
13:45-14:00	O-C-2 Preparation and characterization of molecular crystal based on 2D carriers of NLO properties <i>Ivan Němec, Irena Matulková, Ivana Císařová, Soňa Kohúteková, Petr Němec</i>
14:00-14:15	O-C-3 Isoindoline-1,3-diimine Derivatives Investigated by NMR/XRD/DFT Approach <i>Stanislava Majerova, Ales Ruzicka</i>
14:15-14:30	O-C-4 Structurally Tunable Main Group Metal Complexes Bearing an Electronically Versatile/Fluxional Biguanide Ligand <i>Lukas Vlk, Tomas Chlupaty, Alena Hoffmannova, Zdenka Ruzickova, Ales Ruzicka</i>
14:30-14:45	O-C-5 Hydrogen Peroxide Production: A Sustainable Electrochemical Perspective <i>Desislava Apostolova, Ivo Bardarov, Maris Mathew, Anders Tjell, Ema Gričar, Mark Stari, Igor Plazl, Pedro Martins, Miha Nosan, Torsten Mayr, Dušan Strmcnik, Boštjan Genorio</i>
14:45-15:00	O-C-6 Upcycling Carbon Fiber Composites into Flash Graphene: A HighEfficiency Electrocatalyst for H ₂ O ₂ Synthesis <i>Ivo Bardarov, Elitsa Chorbadzhiyska, Desislava Apostolova, Pedro Martins, Bostjan Genorio</i>
15:00-15:15	O-C-7 The electrochemical activation of a ceria-based sensor for ofloxacin detection <i>Aleksandar Stanojević, Tijana Jovanović, Emilija Pecev-Marinković, Mihajlo Kulizić, Aleksandar Lolić, Aleksandra Pavlović, Ivana Rašić Mišić</i>
15:15-15:30	O-C-8 The comparative evaluation of post-modification activated CPEs modified with MWCNTs, ZrO ₂ and Gd ₂ O ₃ for fluoroquinolone detection <i>Tijana Jovanović, Aleksandar Stanojević, Boris Stanković, Emilija Pecev-Marinković, Branka Petković, Milica Petrović, Ivana Rašić Mišić</i>
Coffee break	
Chairman: Assoc. Prof. Petko Mandjukov	
16:00-16:15	O-C-9 Production of hydrochar from rice husk by hydrothermal carbonization <i>A.B.Toibazarova, N.O.Appazov</i>
16:15-16:30	O-C-10 Extraction of rice husk and preparation of fatty acid monoglycerides from rice husk extract. <i>Bekzhan Alimkhan, Nurbol Appazov, Magzhan Bekhozhaev</i>
16:30-16:45	O-C-11 Battery Emulator built by using RISC Microcontroller architecture <i>Dimitar Boychev, Blagoy Burdin, Daria Vladikova</i>

16:45-17:00	O-C-12 Porous One-dimensional Carbon Nanostructures Derived from Biomass Wastes as Efficient Pt-free Cathodes for Green Hydrogen Production <i>Sara Mahmood Adnan, Eiman. K. Almohannadi, <u>Kamel Eid</u></i>
17:00-17:15	O-C-13 Technologies for the production of activated carbon and features of the raw materials used <i>Saken A. Kanzhar, Nurlan O. Appazov</i>
17:15-17:30	O-C-14 Metrological aspects of analysis of methyl-mercury in marine sediment and biota <i>Ava Amideina, Anna Maria Orani, Sabine Azemard, Petko Mandjukov</i>
17:30-17:45	O-C-15 MP – AES determination of trace elements in waters. Method validation <i>Ava Amideina, Tsvetanka Avramova, <u>Petko Mandjukov</u></i>

Section: Physics Conference hall

Friday, June 13 th	
Chairman: Assoc. Prof. Svetoslav Kolev	
13:30-13:45	O-P-1 Multiferroics- preparation method and physical properties <i>Svetoslav Kolev, Tatyana Koutzarova, Borislava Georgieva, Todor Cholakov</i>
13:45-14:00	O-P-2 Impact of Nutritional Fortification on the Pulsed Photostimulated Luminescence Response of Salts <i>Aleksandar Krleski, Kristina Smokrović, Ivica Đilović, Luka Bakrač, Nadica Maltar-Strmečki, Ralitsa Stanoeva</i>
14:00-14:15	O-P-3 Thermoluminescent Properties of Salt-Based Materials Modified by Nutritional Supplementation <i>Aleksandar Krleski, Ralitsa Stanoeva, Ivana Fabijanikj Sandeva, Lihnida Stojanovska-Georgievska, Margarita Ginovska, Hristina Spasevska</i>
14:15-14:30	O-P-4 Gelatine - glass microbubbles hydrocolloid as potential medical phantom material in computed tomography <i>Ginka Exner, Veselina Georgieva, Yordan Marinov, Georgi Tankovski, Nikoleta Traikova</i>
14:30-14:45	O-P-5 Some physical and physicochemical properties of jelly dessert prepared from gelatin and orange juice <i>Georgi Tankovski, Ivan Bodurov, Ginka Exner</i>
14:45-15:00	O-P-6 Latest observations with the telescopes of the Astronomical Observatory at the University of Shumen <i>Dragomir Marchev, Borislav Borisov, Sunay Ibryamov, Teodora Atanasova-Sartliiska, Galina Yordanova, Alex Georgiev</i>
15:00-15:15	O-P-7 Superscaling analysis of inclusive electron and (anti)neutrino scattering within the coherent density fluctuation model <i>Martin Ivanov, Anton Antonov</i>
Coffee break	

Section: Ecology and Environmental Protection

Hall 4

Friday, June 13 th	
Chairman: Assist. Prof. Miroslav Ivanov	
13:30-13:45	O-EEP-1 Invasive alien freshwater fish species in Black Sea rivers and coastal lakes <i>Luchezar Pehlivanov, Stefan Kazakov, Tihomir Stefanov, Teodora Trichkova</i>
13:45-14:00	O-EEP-2 Development of Asphalt Concrete Production Technologies Using Ash Residues from Thermal Power Plants and Oil Waste <i>Zhangyl Abilbek, Panabek Tanzharikov, Koktem Yerimbetov, Nurzhan Suleymenov and Saken Seitzhanov</i>
14:00-14:15	O-EEP-3 External moss walls: from the inside out <i>Gana Gecheva, Zhana Petkova, Stoyan Damyanov, Deyana Georgieva, Vesselin Baev, Mariyana Gozmanova, Elena Apostolova, Galina Yahubyan</i>
14:15-14:30	O-EEP-4 Comparison of the density and biomass of macrobenthic communities from two regions of Marine Antarctic <i>Lyubomir Kenderov, Eli Mincheva, Raina Hristova</i>
14:30-14:45	O-EEP-5 Development of an efficient “Compact module for filter water” <i>Polvon Sharipov, Khasan Khasanov</i>
14:45-15:00	O-EEP-6 A new metric for ecological status assessment of standing water bodies in Bulgaria <i>Emilia Varadinova, Georg Wolfram, Violeta Tyufekchieva, Yanka Vidinova, Rabia Soufi, Monika Grossschartner</i>
15:00-15:15	O-EEP-7 Macrophyte-Based Assessment of Upland Rivers: Reference Index and Pollution Index <i>Silviya Stankova, Gana Gecheva</i>
15:15-15:30	O-EEP-8 Risk Assessment in Oil and Gas Production: A Case Study of the Kyzylorda Region <i>Zhangyl Abilbek, Panabek Tanzharikov, Aidana Nurman, Aigul Erzhanova, Nurlybek Akhmetov</i>
Coffee break	
Chairman: Assist. Prof. Veselina Dalgacheva	
15:45-16:00	O-EEP-9 Impact of coal fired power plant activity on the ecological status of the river ecosystems: Case study of Sokolitsa River, Bulgaria <i>Vanina Mitseva, Tsevetila Isheva, Mila Ihtimanska, Emilia Varadinova</i>
16:00-16:15	O-EEP-10 Herpetofauna in the Northwestern Foothills of the Pirin Mountains <i>Aleksander Pulev, Emanuil Mitrevichin, Lidia Sakelarieva, Hristo Peshev, Krasimir Stoyanov, Galina Bezinska</i>
16:15-16:30	O-EEP-11 Remote sensing based burn severity mapping and assessing post-fire impacts on forests vegetation in three cases of forest fires in Bulgaria <i>Miroslav Ivanov, Konstantin Tyufekchiev, Veselina Dalgacheva</i>

16:30-16:45	O-EEP-12 Remote sensing based assessment of water quality in the Nador lagoon, Morocco <i>Miroslav Ivanov, Emilia Varadinova, Veselina Dalgacheva, Ouiam El Mekki, Konstantin Tuefekchiev</i>
16:45-17:00	O-EEP-13 First Records of Autumn Activity of <i>Xerotyphlops vermicularis</i> (Merrem, 1820) (Reptilia: Typhlopidae) in Bulgaria <i>Aleksander Pulev, Lidia Sakelarieva, Krasimir Stoyanov, Emanuil Mitrevichin</i>
17:00-17:15	O-EEP-14 New Records of Winter Activity of <i>Mediodactylus kotschy</i> (Steindachner, 1870) (Reptilia: Gekkonidae) in Bulgaria <i>Aleksander Pulev, Lidia Sakelarieva, Krasimir Stoyanov, Hristo Peshev, Daniel Bisset, Emanuil Mitrevichin</i>
17:15-17:30	O-EEP-15 Trail cameras based estimation of the brown bear (<i>Ursus arctos</i> Linnaeus, 1758) density in one isolated part of Rila National Park <i>Miroslav Ivanov, Georgi Manolev, Veselina Dalgacheva</i>
17:30-17:45	O-EEP-16 Comparative analysis of the production and technological potential of the Stanushina variety under the condition of organic/intensive cultivation <i>Aleksandar Klincharov</i>

Geography Hall 3

Thursday, June 12 th	
Chairman: Assist. Prof. Vladimir Karadzhov	
13:30-13:45	O-G-1 Spatial Analysis of Employment and the Working Poor <i>Aleksandra Ravnachka, Velimira Stoyanova, Boris Kazakov, Poli Roukova, Emilia Patarchanova</i>
13:45-14:00	O-G-2 Health status and integration of the Roma into the healthcare system of Bulgaria <i>Boris Kazakov, Aleksandra Ravnachka, Velimira Stoyanova</i>
14:00-14:15	O-G-3 Social policy and the working poor in the context of regional demographic characteristics in Bulgaria <i>Gergana Nikolova, Emilia Patarchanova, Alexandra Ravnachka, Miroslav Ivanov, Vasil Pandurski, Boris Kazakov</i>
14:15-14:30	O-G-4 Mapping and spatial analysis of vertical relief reshaping in the landslide near the village of General Geshevo (Eastern Rhodopes) <i>Alexander Gikov, Stelian Dimitrov, Martin Iliev</i>
14:30-14:45	O-G-5 Integrating GIS in Water Resources Governance for Regional Sustainability: A Case Study from Blagoevgrad Province, Bulgaria <i>Galina Bezinska, Siyka Keseva, Krasimir Stoyanov</i>
14:45-15:00	O-G-6 GIS and Internet of Things <i>Matija Milić</i>

15:00-15:15	O-G-7 A socio-geographical analysis of demographic aging in Bulgaria and Italy at the Nuts II level <i>Dimitar Simeonov</i>
Coffee break	
Chairman: Assist. Prof. Miroslav Ivanov	
15:45-16:00	O-G-8 Heavy metal content in bottom sediments of the Arda River basin upstream of the Kardzhali Dam <i>Zornitza Cholakova</i>
16:00-16:15	O-G-9 Spatial and temporal analysis of the distribution of copper in soils affected by a long-term impact of copper smelter <i>Nadezhda Nikolova, Miglena Zhiyanski</i>
16:15-16:30	O-G-10 Morphological and Hydrological Features of the Krajiste Region (Southeastern Serbia) <i>Milena Milenova; Krasimir Stoyanov; Galina Bezinska</i>
16:30-16:45	O-G-11 Climatic Characteristics of the Krajiste Region (South-east Serbia) and Their Impact on Relief and Geomorphological Processes <i>Krasimir Stoyanov; Milena Milenova; Galina Bezinska</i>
16:45-17:00	O-G-12 An overview of European geographical research on natural borders and their effects <i>Marina Pehlivanova</i>
17:00-17:15	O-G-13 Virtual Tourism as a Tool for Enhancing Destination Accessibility and Sustainability <i>Vladimir Karadzhov, Emilia Patarchanova</i>
17:15-17:30	O-G-14 Contemporary tourism-geographical development of Karlovy vary – a comprehensive model for sustainable development <i>Maria Nosikova</i>

Friday, June 13 th	
Chairman: Assoc. Prof. Aleksandra Ravnachka	
13:30-13:45	O-G-15 Geography of the transport system in the academic field of the Velikotarnovski geographical school <i>Emel Bilyalova</i>
13:45-14:00	O-G-16 Classification of Rural Areas in Southwest Planning Region in Bulgaria Based on Socioeconomic Development Criteria <i>Krasina Radomirska, Plamen Patarchanov</i>
14:00-14:15	O-G-17 Social Processes in the Border Municipalities of the Southwest Region in Bulgaria <i>Vasil Pandurski</i>
14:15-14:30	O-G-18 Household well-being and the risk of poverty <i>Emilia Patarchanova, Gergana Nikolova, Aleksandra Ravnachka, Veselina Dalgacheva, Vladimir Karadzhov</i>

14:30-14:45	O-G-19 Foreign Direct Investment in the Trakia Economic Zone: Models and Economic Effects <i>Olga Gavrilova</i>
14:45-15:00	O-G-20 The Policy of the European Union for the Development of the Agricultural Sector in Rural Areas. <i>Valentin Shlyakov</i>
15:00-15:15	O-G-21 Conditions, factors and spatial organization of viticulture in Pazardzhik region <i>Doycho Vaklinov</i>
Coffee break	

Section: Mathematics

Hall 5

Thursday, June 12 th	
Chairman: Prof. DSc Peter Boyvalenkov	
13:30-13:45	O-M-1 An algebraic approach for construction of (t, s) -sequences <i>Vassil Grozdanov, Vesna Dimitrievska-Ristovska, Petar Sekuloski</i>
13:45-14:00	O-M-2 Multidimensional Quasi-Monte Carlo integration in weighted anchored Sobolev spaces <i>Vassil Grozdanov, Elmi Shabani</i>
14:00-14:15	O-M-3 The Erdős-Turán-Koksma inequality in Cantor systems <i>Atidzhe Hodzhova, Vassil Grozdanov</i>
14:15-14:30	O-M-4 About a new view on the golden ratio <i>Mikhail Kolev, Stanislava Stoilova</i>
14:30-14:45	O-M-5 On some methods of calculation of specific types of integrals <i>Mikhail Kolev, Stanislava Stoilova, Yana Vasileva</i>
14:45-15:00	O-M-6 Criterion of connectedness by clopen coverings <i>Zoran Misajleski</i>
15:00-15:15	O-M-7 On sequence convergence in $(3, j)$ -metric spaces, $j \in \{1, 2\}$ <i>Tomi Dimovski, Dončo Dimovski, Pavel Dimovski</i>
15:15-15:30	O-M-8 Some asymptotic results for the generalized directional short-time Fourier transform with fixed direction <i>Jasmina Veta Buralieva</i>
Coffee break	
Chairman: Prof. Dr. Mikhail Kolev	
16:00-16:15	O-M-9 Simulations of Electoral Systems: How Different Methods of Vote Allocation Affect Political Representation <i>Georgi Bratkov, Boyana Garkova</i>
16:15-16:30	O-M-10 On Some Applications of Second-Order Linear Differential Equations in Economy <i>Sashka Kandilarova</i>

16:30-16:45	O-M-11 Estimation of the difference between continuous and impulsive models <i>Tzanko Donchev, Nikolay Kitanov, Saba Iftikhar, Dimitar Kolev, Boyana Garkova</i>
16:45-17:00	O-M-12 Existence and stability for a parabolic initial and boundary value problem <i>Tzanko Donchev, Boyana Garkova, Saba Iftikhar, Dimitar Kolev, Nikolay Kitanov</i>
17:00-17:15	O-M-13 Attractors of M-Dissipative Evolution Inclusions <i>Tzanko Donchev, Iveta Nikolova, Nikolay Kitanov, Alina I. Lazu</i>
17:15-17:30	O-M-14 Mixed Semicontinuous Riemann-Liouville Evolution Inclusions <i>Tzanko Donchev, Boyana Garkova, Alina I. Lazu, Iveta Nikolova</i>

Friday, June 13th	
Chairman: Assoc. Prof. DSc Vassil Grozdanov	
16:45-17:00	O-M-15 Tolerance and Interval Graphs for Strategic Planning During Health Crises <i>Limonka Koceva Lazarova, Natasa Stojkovik, Aleksandra Stojanova Ilievska, Marija Miteva, Dusan Bikov</i>
17:00-17:15	O-M-16 Graph Theory Applications in Investment Analysis and Risk Modeling <i>Limonka Koceva Lazarova, Anastasija Antova, Natasa Stojkovik, Aleksandra Stojanova Ilievska, Vasko Kokalanov</i>
17:15-17:30	O-M-17 One More Result on Products of Distributions in Colombeau Algebra <i>Marija Miteva, Limonka Koceva Lazarova, Biljana Zlatanovska</i>
17:30-17:45	O-M-18 Persistent Homology-Based Regime Detection for Time Series Forecasting <i>Petar Sekuloski, Vesna Dimitrievska Ristovska</i>
17:45-18:00	O-M-19 Applications of LLM in geometry teaching <i>Petar Sokoloski</i>

Section: Informatics

Hall 5

Friday, June 13th	
Chairman: Assoc. Prof. Nadezhda Borisova	
13:30-13:45	O-I-1 Integrating Exon–Gene Structure into Neural Architectures for RNAseq Classification <i>Aleksandar Jovanović, Michael Sammeth</i>
13:45-14:00	O-I-2 Applications of Machine Learning Algorithms <i>Eyal Sadeh</i>
14:00-14:15	O-I-3 Comparative Analysis of Classification Algorithms on Big Datasets using WEKA <i>Aleksandar Stoimenovski, Irena Atanasova</i>
14:15-14:30	O-I-4 The Accessibility Impact from Changing Existing Schools into Experimental Schools without the Establishment of New Schools: Analyzing Kindergarten and Primary Schools of Florina, Greece, a Case Study <i>Irena Atanasova, Ilias Solakis</i>

14:30-14:45	O-I-5 Some Robotic Process Automation (RPA) Use Cases and Applications in Financial Industry <i>Vladislav Yurukov, Irena Atanasova</i>
14:45-15:00	O-I-6 Data mining - based predicting of students' evaluation and students' acceptance of Distance E-learning. Case study: South-West University "Neofit Rilski" <i>Irena Atanasova, Aleksandar Stoimenovski</i>
Coffee break	
Chairman: Assoc. Prof. Irena Atanasova	
15:30-15:45	O-I-7 Collaborative mindset and AI empowered Knowledge Management <i>Vladislav Yurukov, Irena Atanasova</i>
15:45-16:00	O-I-8 Numerical solution of some facility location and inventory control problems <i>Stefan Stefanov</i>
16:00-16:15	O-I-9 Analysis of data mining algorithms for predicting physical activity of urban populations <i>Irena Atanasova, Svetoslav Petkov</i>
16:15-16:30	O-I-10 Enhancing Computational Thinking and Code Comprehension through Advanced Parsons Puzzles <i>Ivo Damyanov, Martin Madzhov</i>

Section: Methodology in Education Conference Hall

Thursday, June 12 th	
Chairman: Assist. Prof. Dr Damyana Grancharova	
13:30-13:45	O-ME-1 STEAM: learning content development, how to use it, difficulties <i>Ginka Exner</i>
13:45-14:00	O-ME-2 Distance and Independent Learning Contents in a Digital Environment <i>Juraqulova Zulayxo Ixtiyor, Boboev Abrorjon Khotamovich, Toshniyozova Farangiz Burxon</i>
14:00-14:15	O-ME-3 Application of Metacognitive Strategies and Artificial Intelligence in the Learning Process <i>Lyuba Petrova</i>
14:15-14:30	O-ME-4 Continuity issues in the content of the chemistry course between secondary school and university <i>A.B. Toibazarova, N.O. Appazov</i>
14:30-14:45	O-ME-5 Cross curricular relationships in teaching mathematics and informatics in lower secondary school <i>Mediha Topalova, Daniela Tuparova</i>
14:45-15:00	O-ME-6 Methods for Introducing Optimization Algorithms and Mathematical Modeling into the High School Mathematics Curriculum (Grades 8–10) through Interactive Platforms – Wolfram Alpha and Matlab

	<i>Elitsa Atanasova, Feim Musankov</i>
15:00-15:15	O-ME-7 <i>Trakya University STEM Innovation Lab: Philosophy, Structure, Projects, and Future Vision</i> <i>Sertaç Arabacıoğlu, Eylem Bayir</i>
15:15-15:30	O-ME-8 Modeling with scratch for solving movement problems at the lower gymnasium level <i>Rositsa Georgieva</i>
Coffee break	
Chairman: Assist. Prof. Aleksandra Tencheva	
16:00-16:15	O-ME-9 Interactive Learning with Virtual Reality and 3D Printing <i>Damyana Grancharova</i>
16:15-16:30	O-ME-10 Non-formal style in mathematics teaching <i>Nataliya Pavlova</i>
16:30-16:45	O-ME-11 Integrating Sudoku into 5th grade mathematics classes <i>Ivayla Gergova, Boyana Garkova</i>
16:45-17:00	O-ME-12 Prospective Teachers' Demographic Characteristics and Their Beliefs about Their Preparedness to Teach Mathematics <i>Metodi Glavche</i>
17:00-17:15	O-ME-13 The role of the competency-based approach in stem education <i>Krasimir Harizanov</i>
17:15-17:30	O-ME-14 Creative Activity in Food Industry Engineering <i>Rano Mirsamikova, Botir Usmonov</i>
17:30-17:45	O-ME-15 The implementation of stem education in the higher education system <i>Gulnora Aripova, Abror Boboev, Mahmuda Tadjibaeva</i>
17:45-18:00	O-ME-16 Application of a research approach in stem education <i>Sevinch Mustan</i>
18:00-18:15	O-ME-17 Challenges in Informatics Education: Analysis and Improvement Proposals <i>Samuil Zharev, Elena Karashtranova</i>

Special session

Central Auditorium of Conference Center

“Challenges and Opportunities for Implementing STEM Approaches in Secondary and Higher Education”

14.06.2025

10:00 – 12:00

12:00-12:30 Coffee break

POSTER SESSION

Chemistry	
P-C-1	Could an Auophilicity play a role in dimeric Au (III) Diiminoisoindole Complexes? The Group 11 Complexes for the 11th FMNS! <i>Stanislava Majerova, Zdenka Ruzickova, Ales Ruzicka</i>
P-C-2	Positively charged heteroboranes: Synthesis and reactivity <i>Vlastimil Němec, Josef Holub, Maksim A. Samsonov, Jan Vrána, Aleš Růžička</i>
P-C-3	Biosorption of industrial dyes by the dried and inactivated lichen <i>Usnea barbata</i> <i>Katarina Stepić, Radomir Ljupković, Jovana Ickovski, Slobodan Ćirić, Aleksandra Đorđević, Tijana Jovanović, Aleksandra Zarubica</i>
P-C-4	Ethnopharmacological applications of <i>Salvia officinalis</i> L. in the Niš district: Traditional use in oral health disorders <i>Jovana Ickovski, Slobodan Ćirić, Aleksandra Đorđević, Katarina Stepić, Radomir Ljupković, Marija Marković, Vesna Stankov Jovanović</i>
P-C-5	Antimicrobial activity of <i>Hypericum barbatum</i> Jacq. essential oil <i>Aleksandra Đorđević, Goran Petrović, Jovana Ickovski, Radomir Ljupković, Jelena Stamenković, Slobodan Ćirić, Katarina Stepić</i>
P-C-6	Using innovative USB sensors in chemistry <i>Aleksandra Tencheva, Elitsa Chorbazhyska</i>
P-C-7	Characterization of electrocatalysts for cathodes in a microbial electrolysis cell <i>Katerina Angelova, Yordan Angelov, Elitsa Chorbazhyska</i>
P-C-8	Quantitative determination of calcium in the chicken eggshell by ICP-OES method <i>Emilija Pecev-Marinković, Aleksandra Pavlović, Jelena Mrmošanin, Ivana Rašić Mišić, Enisa Selimović, Katarina Milenković, Stefan Petrović, Denis Mitov</i>
P-C-9	DFT Study of the Thermodynamic Aspects of Lutein Oxidative Transformations <i>V. Staykov, Zh. Velkov</i>
P-C-10	Boron and Aluminum Complexes of Electronically Diverse Biguanide Ligand: Synthesis and Reactivity <i>Alena Hoffmannova, Lukas Vlk, Tomas Chlupaty, Zdenka Ruzickova, Ales Ruzicka</i>
P-C-11	Evaluation of Antioxidant Activity and Total Phenolic Content of Red and Green Pepper (<i>Capsicum annuum</i> L.) <i>Jelena Nikolić, Violeta Mitić, Milica D. Nikolić, Milijana Zlatković, Mihajlo Halilović, Milan Mitić, Vesna Stankov Jovanović</i>
P-C-12	Assessment of the chemical composition and biological activity of essential oil from Bulgarian yarrow (<i>Achillea millefolium</i>) <i>Krastena Nikolova, Natalina Panova, Anelia Gerasimova, Yulian Tumbarski, Ivan Ivanov, Ivayla Dincheva, Christina Tzvetkova, Galia Gentscheva</i>

P-C-13	Determination of Cd, Cu, and Zn in White, Integral, and Red Rice Varieties Using ICP-OES <i>Stefan Petrović, Snežana Tošić, Milica Marković, Ava Amideina, Violeta Mitić, Jelena Nikolić, Vesna Stankov Jovanović</i>
P-C-14	Impact of Wildfire on the Antioxidant Potential of <i>Doronicum columnae</i> : A Biochemical Assessment of Methanolic Extracts from Fire-Affected and Control Sites <i>Vesna Jovanović, Jelena Nikolić, Marija Marković, Marija Ilić, Marija Dimitrijević, Milan Mitić, Violeta Mitić</i>
P-C-15	Argan shell-derived carbon material as an efficient sorbent for water treatment <i>Petranka Petrova, Elitsa Chorbazhiyska, Maya Chochkova, Tarik Chafik, Katerina Angelova, Jordan Angelov, Georgios Uzunis</i>
P-C-16	Design and multifunctional performance of a novel zinc-based MOF constructed from TCPT ligand <i>Rusi Rusew, Hristina Lazarova, Magdalena Angelova, Vanya Kurteva, Rositsa Nikolova, Boris Shivachev</i>
P-C-17	Mineral resource base of Uzbekistan for obtaining modern geopolymers <i>Zebo Babakhanova, Shokhnoza Ruzimova</i>
P-C-18	New cysteine derivatives with amantadine, rimantadine and memantine and evaluation of their chemical stability <i>Antoniya Stoymirska, Kiril Chuchkov, Radoslav Chayrov, Ivanka Stankova</i>
P-C-19	Chemical stability of new aminoadamantane analogues with N-acetylcysteine <i>Antoniya Stoymirska, Kiril Chuchkov, Radoslav Chayrov, Ivanka Stankova</i>
P-C-20	Double-layer leather handcraft belt: Design, Technology and Chemistry <i>Mitko Stoev, D. Zheleva, N. Spasova</i>
P-C-21	Substrates with natural zeolites and fertilizers for smart orchid cultivation <i>Mitko Stoev, Elitsa Chorbazhiyska</i>
P-C-22	A Direct Microwave-Accelerated Wittig reaction for synthesis of substituted cinnamates <i>Maya Chochkova, Ernst Lankmayr, Petranka Petrova, Tsenka Milkova</i>
P-C-23	Synthesis, hydrolytic stability and antiviral studies of Sulfur-based anti-influenza drugs <i>Maya Chochkova, Boyka Stoykova, Petranka Petrova, Nejc Petek, Martin Štícha, Jurij Svete, Lubomira Nikolaeva-Glomb, Yuhuan Li</i>
P-C-24	Residual Deviations Analysis – A Powerful Calibration Linearity Criterion. Visual Test or Reliable Statistical Tool? <i>Ava Amideina, Petko Mandjukov</i>

Physics	
P-P-1	Electron beam welding of titanium and aluminum alloys with a vanadium filler <i>Darina Kaisheva, Georgi Kotlarski, Maria Ormanova, Vladimir Dunchev, Angel Anchev, Borislav Stoyanov, Stefan Valkov</i>
P-P-2	Investigation of laser produced noble metal-semiconductor nanostructures <i>Mihaela Koleva, Anna Dikovska, Nikolay Nedyalkov, Tsanislava Genova</i>
P-P-3	All-optical characterization of the magnetic properties of nanocomposite bulk samples <i>Elena Taskova, Svetoslav Kolev, Tatyana Koutzarova</i>
P-P-4	Crystallography and electrical impedance spectroscopy of TiO ₂ thin films deposited on Al substrates <i>Daniela Stoeva, Georgi Kotlarski, Dimitar Dechev, Nikolay Ivanov, Stefan Valkov, Maria Ormanova, Valentin Mateev, Iliana Marinova</i>
P-P-5	Influence of diffusion on the propagation of optical beams in alkali metal vapors <i>Nikola Nikolov, Stoyan Tsvetkov, Sanka Gateva</i>
P-P-6	Analysis of the decay of the ⁹ B nucleus in the dissociation of the ¹⁰ C nucleus <i>Ralitsa Stanoeva</i>
P-P-7	Modeling in electrochemical characterization of electrode materials <i>Pavel Chorbadzhiyski, Metodi Popstoilov, Elitsa Chorbadzhiyska</i>
P-P-8	Modeling in energy efficiency - autonomously powered systems <i>Pavel Chorbadzhiyski, Metodi Popstoilov, Elitsa Chorbadzhiyska</i>
P-P-9	Stimulated Raman Scattering in quartz fibers around the point of zero dispersion <i>Lyuben Ivanov</i>
P-P-10	Applicability of quartz for dosimetric purposes <i>Ivana Fabijanikj Sandeva, Aleksandar Krleski, Lihnida Stojanovska-Georgievska, Margarita Ginovska, Hristina Spasevska</i>

Geography	
P-G-1	Anthropophysiological characteristics of the contemporary Bulgarian population in Northeastern Bulgaria <i>Nadezhda Paraskova, Magdalena Pirinska – Apostolu</i>
P-G-2	Presence of wormian bones in adult human skulls from Late Roman period - Salona, Dalmatia <i>Ralitsa Bogdanova, Magdalena Pirinska-Apostolu</i>
P-G-3	The influence of social factors on the physical development and maturation of girls (12-16 years old) from Sliven district - Bulgaria <i>Pirinska - Apostolu Magdalena, Nadezhda Paraskova, Ralitsa Bogdanova</i>
P-G-4	Geographical studies of urbanization processes and their spatial organization in Bulgaria <i>Evelina Filatova, Emilia Patarchanova</i>

P-G-5	Evaluating Urban Expansion Using a City-Scale Dasymetric Population Map: A Case Study of Bursa, Türkiye <i>Mustafa Köse; Nilanchal Patel, Galina Bezinska</i>
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Ecology and Environmental Protection	
P-EEP-1	First and confirmative records of four mayflies (Insecta: Ephemeroptera) from the Republic of North Macedonia <i>Biljana Rimcheska, Yanka Vidinova</i>
P-EEP-2	Optimizing nitrogen retention through novel magnesium-urea complexes: monitoring ammonia emissions in soil environments <i>Gergana Velyanova</i>
P-EEP-3	Some aspects of the chemical pollution from CFPPs of Razmetanitsa and Sokolitsa rivers <i>Vanina Mitseva, Elena Karashtranova, Emilia Varadinova</i>
P-EEP-4	Monitoring European beech phenology in two long-term ecological research sites by remote sensing <i>Svetoslav Anev, Sonya Damyanova</i>
P-EEP-5	Microbiological status of soils within the scope of the site Petrohan, LTER-BG <i>Bilyana Grigorova-Pesheva, Sonya Damyanova, Pavel Pavlov</i>
P-EEP-6	Data Fusion for Ecosystem Services Assessment: a Case Study in Bulgarian South-western Rila Mountains <i>Kostadin Katrandzhiev, Kremena Gocheva, Radka Fikova, Svetla Doncheva</i>

Mathematics	
P-M-1	Obtaining an Analytical Solution of First-Order Differential Equations with ChatGPT <i>Biljana Zlatanovska, Marija Miteva, Natasa Koceska, Saso Koceski, Limonka Koceva Lazarova, Mirjana Kocaleva Vitanova</i>

Informatics	
P-I-1	Application of Computer Visualizations in Scientific Data Analysis <i>Radoslav Mavrevski, Miglena Trencheva, Metodi Traykov, Tereza Trencheva, Ivan Trenchev</i>
P-I-2	Adaptive Learning in Mixed Reality: New Horizons for Personalized Education <i>Vladimir Angelov, Yana Karshiyska, Kamelia Shumanova, Borislav Zashev</i>
P-I-3	Construction and optimization of the seventh-order polynomial convolutional interpolation 2P kernel <i>Zoran Milivojevic, Nataša Savić, Bojan Prlinčević, Violeta Stojanović, Dijana Kostić</i>

Methodology in Education	
P-ME-1	Robots and Reassurance: Teacher Insights into a New Curriculum for Anxiety-Free Math Learning <i>Nadezhda Borisova, Elena Karashtranova, Ineta Helmane, Linda Daniela, Hasan Arslan, Yasemin Abalı Öztürk, Kadir Tunçer, Danguole Rutkauskiene, Kornelia Daukintyte, Aleksandra Zajac</i>
P-ME-2	Chemistry - fun and interesting using STEM approaches <i>Aleksandra Tencheva, Elitsa Chorbadzhiyska</i>
P-ME-3	How Important is STEM Integration in Modern Teaching: Survey Insights <i>Damyana Grancharova</i>

same study area (Katrandzhiev et al. 2022) to explore the connection between ecosystem condition and the provision of cultural ecosystem services through the Whole System approach adopted in the Methodological framework.

We develop calculation algorithms for each parameter of the selected services. For identified gaps in the calculation of some parameters we develop calculation algorithms appropriate to the study area. We then collect available local scale data such as visitor numbers for local cultural heritage sites, calibrate the assessment scale by developing parameter level scales as necessary (e.g. for protected area type, access method type, ecosystem condition based on satellite observations), and calculate the numeric values for the score of provision capacity for the three cultural ecosystem services using the same scale as in the national assessment – between 1 for lowest and 5 for highest capacity. We found a high provision capacity (4,4 for 3112, 3,65 for 3123 and 3,87 for 3222) for all assessed services in the studied HME. The presented assessment is both a contribution to the localisation of the Methodological framework, and to assigning semi-quantitative values to abstract ecosystem services.

Keywords: Ecosystem services assessment, Data fusion, High- mountain ecosystems, Expert- based approach

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Mathematics

P-M-1 Obtaining an Analytical Solution of First-Order Differential Equations with ChatGPT

*Biljana Zlatanovska, Marija Miteva, Natasa Koceska, Saso Koceski, Limonka
Lazarova, Mirjana Kocaleva*

Abstract: ChatGPT is a part of the artificial intelligence developed by OpenAI, which was officially launched in 2022. It is a tool that enables interactive conversations and provides explanations, guidance and information across various fields related to everyday life, education and professional work. On the other hand, differential equations are deeply connected to nature and the laws of physics, playing an essential role in the mathematical modeling of real-world phenomena. Therefore, in this paper we analyze ChatGPT's capability to solve first order ordinary differential equations, with a focus on obtaining accurate analytical solutions. Our focus will include the following types of equations: equations with separable variables, linear and Bernoulli differential equations, as well as some nonlinear differential equations. Our goal is, through analysis of various examples to conclude the accuracy and applicability of ChatGPT in solving this type of mathematical problem.

Keywords: differential equation, ChatGPT, solution of differential equation

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Informatics

P-I-1 Application of Computer Visualizations in Scientific Data Analysis

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