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4th International Conference on Sustainable Futures: Environmental, Technological, Social and Economic Matters

To cite this article: S O Semerikov *et al* 2023 *IOP Conf. Ser.: Earth Environ. Sci.* **1254** 011001

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4th International Conference on Sustainable Futures: Environmental, Technological, Social and Economic Matters

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Abstract. This paper presents the preface of the proceedings for the 4th International Conference on Sustainable Futures: Environmental, Technological, Social, and Economic Matters (ICSF 2023), a multidisciplinary event that explores the challenges and opportunities of sustainability in various domains. The preface outlines the conference's objectives, themes, workshops, and topics, as well as its contribution to advancing sustainable development and global dialogue. It also acknowledges the efforts and inputs of various stakeholders who have made the conference possible, especially in light of the pandemic situation. Furthermore, it thanks IOP Publishing for its support and flexibility in facilitating open access publishing. The paper concludes by looking forward to future editions of ICSF and the ongoing quest for a more sustainable and interconnected world. The paper invites readers to delve into the rich and diverse content that shapes this influential conference.



1. Introduction

Welcome to the **International Conference on Sustainable Futures: Environmental, Technological, Social, and Economic Matters (ICSF)** proceedings. This conference serves as a cornerstone for global discourse on sustainable development, providing a peer-reviewed international platform where researchers, scientists, engineers, and practitioners converge to share their latest research findings, innovative ideas, and practical applications. As we delve into these proceedings, we embark on a journey across diverse disciplines, united by a common goal of advancing sustainable practices.

Figure 1 showcases the emblem of ICSF 2023, a symbol of our collective commitment to fostering sustainable futures.



Figure 1. The emblem of ICSF 2023.

Since its inauguration in 2020, ICSF has cultivated a space that encompasses the entire spectrum of sustainable development. With a focus on the intricate intersections of sustainability, environment, and technology, ICSF explores their far-reaching implications for corporations, governments, educational institutions, regions, and societies, both in the present and the future [1–4].

ICSF 2023 stands as a two-tiered platform, comprising pre-conference workshops and the main conference, ensuring an enriched experience for all participants.

The subsequent sections delve into the diverse workshops that comprised ICSF 2023:

The *Sustainable Development of Mining Science and Industry Workshop (SusDevMiningSci'2023)* stands as a peer-reviewed international forum dedicated to exploring cutting-edge scientific and technological achievements in mine safety, geological research, and the preservation of mineral resources. With a focus on topics spanning mining subsurface exploration, mining systematology, and geotechnical engineering, this workshop underlines our commitment to sustainable practices. Dr. Serhii Chukharev leads the program committee, guiding these vital discussions.

Workshop URL: <https://sites.google.com/knu.edu.ua/nigri-ecochemsd-ws2023/>.

1.1. *Geography for Sustainable Development (GSD-2023)*

Geography for Sustainable Development (GSD-2023) serves as a peer-reviewed international workshop, offering a platform for researchers deeply engaged with the challenges of sustainable development within the geographical context. Covering an array of topics, including biogeochemical cycles, climate, natural resources, and more, this workshop is a testament to the expansive scope of geography's role in shaping sustainable futures. Dr. Olga Bondarenko guides these explorations through her leadership.

Workshop URL: <https://bondarenkoolga9.wixsite.com/gsd-2023>.

1.2. *Ecochemistry for Sustainable Development (EcoChemSD-WS'2023)*

The *Ecochemistry for Sustainable Development Workshop (EcoChemSD-WS'2023)* operates as a peer-reviewed international gathering, nested within the 4th International Conference on Sustainable Futures: Environmental, Technological, Social, and Economic Matters (ICSF). This workshop engages with the multidimensional aspects of environmental chemistry, ecochemistry, and their resonance within fields such as geochemistry, agroecology, and green chemistry. Dr. Pavlo Nechypurenko spearheads these discussions, forging pathways towards sustainable chemical practices.

Workshop URL: <https://sites.google.com/view/ecochemsd-ws2023>.

1.3. *Biodiversity and Ecosystems Sustainability (BiodES-2023)*

Biodiversity and Ecosystems Sustainability (BiodES-2023) stands as a peer-reviewed international workshop, lending its focus to the critical task of conserving biodiversity and fostering ecosystem sustainability. Rooted in applied science and education, this workshop offers a vital foundation for addressing global challenges and nurturing sustainable futures. Dr. Viacheslav Osadchy leads the charge in exploring the intersection of environmental, technological, and biological aspects in this context.

Workshop URL: <http://biodes.mdpu.org.ua/>.

1.4. *Water Management and Environmental Engineering (WaterManEnvE-2023)*

The *Water Management and Environmental Engineering Workshop (WaterManEnvE-2023)* stands as a peer-reviewed international platform, encapsulating contributions that span the breadth of water management, environmental engineering, and educational technologies. With a focus on topics including water resources, irrigation, hydraulic engineering, and more, this workshop navigates the complexities of managing our most precious resource sustainably. Dr. Serhii Klimov provides direction for these explorations.

Workshop URL: <https://sites.google.com/nuwm.edu.ua/watermanenve-ws2023/>.

1.5. *Innovative Approaches for Solving Environmental Issues (IASEI-2023)*

Innovative Approaches for Solving Environmental Issues (IASEI-2023) converges as a peer-reviewed international workshop, focusing on advancing environmental science research. Covering topics ranging from environmental protection to nuclear safety and technological solutions, this workshop embodies the spirit of pioneering solutions for pressing environmental challenges. Dr. Andrii Iatsyshyn leads the charge in cultivating innovative discussions.

Workshop URL: <https://www.igns.gov.ua/en/iasei-ws-2023/>.

1.6. *Sustainable Energy Workshop (SEnW-2023)*

Sustainable Energy Workshop (SEnW-2023) embarks on an exploration of innovative solutions in energy systems. Covering a diverse array of topics including solar and wind energy, energy policy, climate change, and more, this workshop underlines the essential role of sustainable

energy in shaping our future. Guided by Dr. Volodymyr Artemchuk, this workshop paves the way for sustainable energy practices.

Workshop URL: <https://ipme.kiev.ua/en/SEnW-2023/>.

1.7. Conference sessions

The conference unfolded through a series of sessions, each shedding light on different facets of sustainable development. These sessions encompassed topics ranging from sustainable materials and technologies to socio-economic development, energy systems, and beyond. These sessions, as detailed below, comprised the backbone of ICSF 2023:

- Session 1. Sustainable Materials and Technologies (May 23, 2023)
- Session 2. BiodES-2023 – Biodiversity and Ecosystems Sustainability. Sustainability, Biodiversity and Conservation (May 23, 2023)
- Session 3. SEnW-2023 – Sustainable Energy Workshop. Sustainable Energy. Infrastructure and Sustainability (May 23, 2023)
- Session 4. SusDevMiningSci'2023 – Sustainable Development of Mining Science and Industry. Geotechnical and Geoenvironmental Engineering. Sustainable Mining (May 23, 2023)
- Session 5. Sustainable Building and Architecture. Sustainable Cities and Society (May 24, 2023)
- Session 6. WaterManEnvE-2023 – Water Management and Environmental Engineering. Environmental Engineering, Sustainability, and Green Technology (May 24, 2023)
- Session 7. EcoChemSD-2023 – Ecochemistry for Sustainable Development. Sustainable Use of Natural Resources (May 24, 2023)
- Session 8. IASEI-2023 – Innovative Approaches for Solving Environmental Issues. Environmental Pollution and Sustainable Development. Environmental Risk Assessment and Sustainable Development. Sustainable Environment and Environmental Management (May 24, 2023)
- Session 9. Sustainable Socioeconomic Development. Governance, Legislation and Policy for Sustainability (May 25, 2023)
- Session 10. GSD-2023 – Geography for Sustainable Development. Agroecology and Sustainable Food Systems. Geography and Sustainability. Sustainable Transport (May 26, 2023)

This volume is a repository of the scholarly contributions presented at ICSF 2023. With meticulous reviews conducted by a minimum of three program committee members, the selected papers embody the spirit of rigorous exploration and discovery.

Authors were invited to submit full research papers including surveys, tutorials, perspective/colloquia articles in conference topics of interest (<https://www.morressier.com/call-for-papers/62c564c8178bca0013ca7d13>). There were 243 submissions received. Each submission was reviewed by at least 3 program committee members. The committee decided to accept 147 papers.

The unfolding events of the ongoing Russian invasion of Ukraine necessitated a hybrid conference format. By embracing both in-person and online modes, ICSF 2023 extended its reach across borders, allowing more than 200 participants from 18 countries to participate through platforms such as Zoom and Google Meet.

The presentation slots were defined as follows:

- invites talks (25 min): 15 min presentation, 10 min question answering and discussion,

- other talks (15 min): 10 min presentation and 5 minutes question answering and discussion.

The full ICSF 2023 program is available at the <https://icsf.ccjournals.eu/2023/> where details of the sessions, usually headed by one or more invited presentations. Video records of talks are available at the *Not So Easy Science* YouTube channel (<https://www.youtube.com/channel/UCh3gego79m-ofCiNEgEzMuA>).

2. ICSF 2023 program committee

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3. ICSF 2023 organizers

The 4th edition of the International Conference on Cognitive and Natural Sciences (ICSF) was meticulously coordinated by the Academy of Cognitive and Natural Sciences (ACNS), a non-governmental organization dedicated to nurturing the growth of researchers' expertise in the cognitive and natural sciences arena. ACNS's mission encompasses enhancing research, safeguarding rights and liberties, and catering to professional, scientific, social, and various other interests.

ACNS is engaged in a spectrum of activities, including:

- Spearheading research initiatives within the cognitive and natural sciences domain and fostering collaborative ties among researchers [124, 125].

- Orchestrating conferences, workshops, training sessions, internships, and other platforms for the exchange and dissemination of knowledge in the realm of cognitive and natural sciences [126, 127].
- Publishing scientific journals, conference proceedings, collections of scholarly works, and related materials (<https://acnsci.org/cms/journals/>).

Among ACNS's prominent publications is the Diamond Open Access journal titled *Educational Technology Quarterly* (ETQ) [128], a peer-reviewed journal delving into the ways digital technology can enrich the field of education. Notably, ETQ covers a broad range of topics aligned with the Sustainable Development Goals (SDGs), with the exception of Goal 4 – Quality Education.

Here are select topics from *Educational Technology Quarterly* (ETQ) categorized by SDG goals:

SDG 3 (Good Health and Well-being)

- Addressing continuing education during the pandemic and preparing children for STEAM education, aligning with health and education goals [129].
- Examining the well-being of employees during remote work and the impact of stress on their mental health [130].
- Exploring the use of cloud technologies in education during the COVID-19 pandemic, potentially enhancing education and well-being [131].
- Enhancing physical education teachers' competency in health preservation, contributing to improved well-being [132].
- Investigating the use of virtual reality in education to improve student health and learning outcomes [133].

SDG 8 (Decent Work and Economic Growth)

- Aligning educational programs with real-life job requirements to ensure quality education and employability [134].
- Enhancing education and career guidance through innovative digital solutions [135].

SDG 9 (Industry, Innovation, and Infrastructure)

- Improving infrastructure and technological innovation in education [136].
- Enhancing education quality and integrating digital tools, aligning with education and technological innovation goals [137].
- Elevating the quality of education and enhancing technology infrastructure for software engineering education [138].
- Elevating the quality of physics education (STEM) through blended teaching methods and technology integration [139].
- Developing academic cloud infrastructure and integrating innovative technology platforms to improve education quality [140].
- Enriching the learning environment through digital transformation and innovative technologies [141, 142].
- Enhancing the quality of distance education through expert examination and training programs for course developers [143].
- Leveraging innovative technologies like augmented reality to enhance language education [144].
- Analyzing the impact of digital disruption on education and business continuity, aligning with improving education quality and technological innovation [145].
- Utilizing online courses to enhance programming education and promote innovation in education [146].

- Creating an educational encyclopedia to disseminate verified knowledge, promoting education quality and innovation [147].
- Enhancing education quality and innovation through virtual labs [148].
- Integrating STEM education and technology, aligning with educational quality and innovation goals [149].

SDG 15 (Life on Land): Utilizing plant recognition systems to support environmental awareness and conservation efforts [150].

SDG 16 (Peace, Justice, and Strong Institutions): Monitoring and countering negative psychological influences, which might promote peace and well-being [151].

4. Proceedings structure

4.1. *Advancements in materials science and engineering for sustainable development*

This proceedings section delves into the realm of materials science and engineering, unveiling a tapestry of innovative research endeavors aimed at fostering sustainable development. The featured studies collectively showcase the intricate relationship between material composition, quality, and their impact on various industrial processes and applications [152]. From investigating the role of lime content in iron ore sintering [153] to the sustainable performance of alkali-activated cement concrete with exceptional freeze-thaw resistance [154], the range of topics traverses the spectrum of material behavior and application.

The section delves into the realm of alternative materials, exploring sustainable modified pozzolanic supplementary cementitious materials harnessed from natural zeolite, fly ash, and silica fume [155]. Furthermore, it presents a meticulous balance between theoretical and practical aspects, with research on the stress-strain state of compressed concrete-filled steel tube elements [156] and the influence of deformation degree on grain sizes in metal alloys during cold rolling of sheets [157].

Innovation takes center stage with studies on robust methods for controlling casting processes and casting quality [158], as well as the technology behind forming wear-resistant thermite alloy layers through high-temperature synthesis [159]. The intersection of material science and medical applications is also explored, as evidenced by the design and research of biologically active polymeric hydrogel transdermal materials modified by humic acid [160].

Electromagnetic radiation protection finds a place in this collection, focusing on ceramic-inorganic polymer composites that harmonize mechanical properties with efficient electromagnetic shielding [161]. The section also touches upon the evolving energy landscape, offering insights into enhancing the discovery and storage of natural gas deposits [162], including improvements in drilling mud and terrestrial storage-shelter facilities [163].

In essence, this proceedings section encapsulates the pioneering strides made within materials science and engineering, underscoring their pivotal role in realizing sustainable development goals across a diverse range of sectors and applications. The studies presented here illuminate the path toward a more resilient and resource-efficient future.

4.2. *Ecological dynamics and biodiversity assessment in changing environments*

This section of the proceedings unveils a diverse array of studies centered around the intricate interplay between ecological dynamics and biodiversity assessment within evolving environments. The talks featured here encapsulate the multifaceted nature of environmental changes and their profound impact on various facets of ecosystems.

Exploring the ecomorphic aspect of soil macrofauna community transformation under recreational impact [164], the section kicks off by delving into the intricate relationships between human activities and the delicate balance of terrestrial ecosystems. Moving forward, biocenotic influence takes the spotlight as researchers investigate the role of the great cormorant in shaping the Azov-Black Sea region's biodiversity [165].

The section transcends traditional boundaries by addressing the accumulation of endocrine-disrupting compounds in aquatic organisms, offering insights into the potential ecological and hygienic implications of pollutant accumulation in *Procambarus Virginalis* tissue from the Dnipro River [166]. Biodiversity assessment within the Danube region emerges as a pivotal tool for the development of protected areas [167], showcasing the critical role of scientific research in conservation planning.

Evaluating the impact of environmental stressors, researchers explore seeds' similarity between cultural and natural flora in southern Ukraine under chloride load [168]. Furthermore, the section highlights the importance of information provision for monitoring sustainable development [169], emphasizing the synergy between ecological research and effective management strategies.

Intricacies of marine ecosystems come to the fore as a system of environmentally important decision-making is delineated for the sustainable use of marine estuaries in the face of anthropogenic and climatic changes [170]. Chromosomal studies in *Pelophylax ridibundus* across different populations unveil insights into the genetic makeup of amphibian populations in southern Ukraine [171].

Expanding the horizon, researchers probe the impact of mini-hydropower on water chemistry and phytoplankton in Ukrainian reservoirs [172], offering a glimpse into the intersection of renewable energy and ecosystem dynamics. The section culminates in an analytical examination of wind farm impact on bats, using activity indices and species diversity to decipher the intricate relationship between wind energy and bat populations [173].

Through temporal dynamics of steppe plant communities [174] and differential ecomorphic analysis of urban park vegetation [175], this proceedings section encapsulates the nuanced exploration of ecological shifts and biodiversity assessments in a dynamically changing world. The contributions within this section collectively illuminate the multidimensional nature of environmental challenges and the intricate pathways towards sustainable solutions.

4.3. Innovations in energy systems and sustainable technologies

This section of the proceedings brings together a diverse array of presentations that collectively epitomize the cutting-edge innovations and research breakthroughs in energy systems and sustainable technologies. The talks featured in this section traverse the intricate landscapes of energy generation, consumption, storage, and efficiency, shedding light on the profound advancements shaping the future of the energy sector.

The journey commences with explorations into the application of on-board energy storage in electric locomotives for quarry railway transport [176], unveiling novel strategies to enhance energy efficiency in industrial transportation. Shifting focus to economic potential, researchers delve into the realm of anaerobic fermentation and green ammonia production [177], envisioning a pathway to leverage sustainable energy sources for the European energy market.

Monitoring and diagnostic systems for hydro units, coupled with smart grid technology, occupy the spotlight as researchers navigate the complexities of maintaining optimal technical conditions [178]. Electricity consumption simulation using advanced modeling techniques illuminates the intricate patterns that govern energy demand [179].

Addressing environmental challenges, atmospheric dispersion modeling under high uncertainty conditions provides critical insights into managing potential hazards [180]. Short-term electricity imbalance forecasting utilizing artificial neural networks underscores the synergy between cutting-edge computational methods and energy grid stability [181].

The proceedings then delve into a SWOT analysis of electric transport [182], unveiling opportunities for vehicle-to-grid (V2G) integration and its potential impact on power system sustainability. The crucial intersection of education and sustainability takes center stage as researchers delve into the role of high-quality education in fostering resilience in the face of

energy challenges [183].

In the context of renewable energy development, investigations into the capabilities of Ukrainian higher educational establishments to meet personnel demands underscore the importance of knowledge dissemination [184]. The section progresses with research focused on components for heat storage materials, embracing energy storage as a cornerstone of sustainable systems [185].

From computational challenges [186–193] to real-world implementation [194–197], this proceedings section encapsulates the evolving landscape of energy systems and sustainable technologies. The presentations within this section collectively illuminate the innovative spirit driving the transition toward cleaner, more efficient, and resilient energy solutions [198].

4.4. *Advancements in mining and minerals engineering*

This section of the proceedings provides an insightful journey through the domain of mining and minerals engineering, where an array of research endeavors converges to advance innovation, efficiency, and sustainability within the industry. The talks featured herein encompass a diverse spectrum of subjects, ranging from pioneering technologies for mining operations to strategies optimizing resource utilization and elevating worker safety.

- *Exploring mining operations.* The section commences with an exploration of advanced control strategies applied to multi-pump systems in underground mines. This research showcases the integration of fuzzy inference systems for controlling power consumption [199]. A subsequent dive into the dynamic interplay between solid particles and hydraulic classifiers enriches our comprehension of material flow behavior [200].
- *Innovations in mining technology.* Advancements in mining technology take center stage, introducing innovative approaches to equipment combinations within longwall mining. These adaptations exemplify the industry's resourceful response to geological challenges [201]. Concurrently, the utilization of vibratory jaw crushers with inclined crushing chambers symbolizes the pursuit of processing efficiency for brittle materials [202].
- *Balancing economics and sustainability.* The conference also delves into economic dimensions, investigating the intricate nexus between open pit productivity and wider economic indicators of mining development [203, 204]. Furthermore, a meticulous study of hydroerosion process parameters provides pivotal insights for sustainable mining practices [205].
- *Resource optimization and development.* Optimization emerges as a central theme, from determining drilling parameters to enhance resource extraction efficiency [206]. Meanwhile, the proceedings encompass sustainable development initiatives, such as cluster creation and risk management strategies that enhance worker safety [207].
- *Maximizing efficiency in mining processes.* In-depth insights into the operation of percussion downhole drilling machines reflect the industry's commitment to process optimization [208], yielding pathways to enhanced productivity. Investigating the component composition of processed forming mixtures underscores the need for resource reuse through mineralogical analysis and reuse recommendations [209].
- *Strategic approaches to sustainability.* Sustainability takes a prominent role through discussions on sustainable development approaches via mining cluster creation [210], highlighting collaborative clusters as drivers of regional growth while adhering to sustainability principles. A study centered on clusterization of dissipative structures enhances our understanding of complex systems' behavior [211].
- *Predictive models for safer mining.* Numerical simulation of surface subsidence during coal seam excavation advances predictive modeling [212], enhancing safety in underground

mining operations [213]. The symposium's focus also extends to the dynamic interplay between thin-walled reinforced concrete shells and foundation soil, emphasizing structural integrity and longevity [214].

- *Resource management and analysis.* The proceedings spotlight technological solutions for efficient resource management through investigations into automatic control devices for oil quantity and quality in reservoirs [215, 216]. Integrated research into stress-strain state anomalies offers insights into subsurface behavior, guiding strategies for safer and sustainable mining practices [217].
- *Understanding raw materials.* The multifaceted nature of resource extraction is explored through inquiries into the influence of natural mineral impurities and moisture on hazardous coal seam properties [218]. Understanding raw material characteristics emerges as a cornerstone for safe and sustainable mining practices.
- *Efficiency in ore extraction.* Enhancements in caved ore drawing techniques from ore deposit footwalls exemplify the industry's commitment to economic and environmental advancement [219], contributing to more efficient ore extraction.
- *Precision in mining operations.* Identification of resistance torque in drill rod rotation underscores precision and safety in mining operations, emphasizing the importance of machinery dynamics [220].
- *Strategic resource management.* Geometrization of Kryvbas iron ore deposits leverages technology and geological analysis to inform resource management [221], illuminating the spatial dimensions of mineral deposits.
- *Enhancing mineral processing.* Refining beneficiation techniques takes center stage through parameters evaluation in the process of solid-phase pulp sedimentation [222], contributing to resource efficiency and waste reduction in mineral processing.
- *Analytical advancements.* Recognition of mineralogical and technological varieties through ultrasound backscatter spectrograms signifies progress in analytical methods, aligning with the industry's pursuit of precise and sustainable resource characterization [223].
- *Predictive models for safer operations.* The section culminates with a spotlight on resource utilization, as researchers present innovative approaches for repurposing mining waste and acid mine drainage into valuable nanoparticles [224]. Additionally, the symposium delves into the influence of mineral content and moisture on coal seam behavior, unveiling the intricate facets that underlie hazardous properties [225].

In essence, this proceedings section underscores the pivotal role of engineering and scientific advancements in shaping the future of mining and minerals engineering. Collectively, the presentations reflect the industry's unwavering pursuit of technological progress and sustainable practices, resulting in a comprehensive exploration of mining's evolving landscape.

4.5. Innovations in architecture, urban planning, and sustainability

Within the bounds of this proceedings section, a tapestry of innovative concepts and solutions in architecture, urban planning, and sustainability unfurls. The diverse array of talks curated in this section showcases the dynamic evolution of design and planning practices, rooted in both tradition and cutting-edge technology.

The exploration begins with a study on the determination of bearing capacity in biaxially bended beams, an endeavor central to structural design [226]. Bridging the gap between the built environment and nature, a biotechnical approach to enhance indoor and outdoor air quality captures the essence of sustainability in architecture [227].

The integration of information systems takes center stage as a multi-stage analysis of object models on construction sites is presented [228]. This discourse transcends conventional boundaries, reflecting the synergistic blend of technology and construction practices.

Groundwater treatment using polystyrene foam filters exemplifies the innovative application of materials in environmental engineering [229]. This approach showcases the ingenious ways in which modern materials can contribute to ecological solutions.

History and culture intertwine as traditional settlements are explored for lessons in preservation. Comparative studies of Shirakawa village in Japan and Kryvorivnia village in Ukraine delve into strategies for preserving heritage while maintaining functionality [230].

In post-conflict landscapes [231], the principles of urban restoration are examined, offering insights into the intricate balance of reconstructing urban spaces that are both functional and reflective of the community's needs [232].

The section concludes with an insightful overview of transformational processes in sustainable urban development, specifically in the context of Ukraine [233]. Perspectives on cultural tourism's development in the Carpathian region lend depth to the discourse [234], reflecting the intersection of cultural heritage and economic growth.

As a blend of innovative thinking, traditional wisdom, and contemporary technological advancements, this section encapsulates the essence of architecture, urban planning, and sustainability. The talks therein serve as a testament to the multifaceted nature of these disciplines and their profound impact on shaping the present and future of our built environment.

4.6. Advances in hydrology, water management, and environmental engineering

This section of the proceedings unearths a diverse range of talks, each a vital piece in the mosaic of hydrology, water management, and environmental engineering [235]. The common thread woven through these discussions is a shared commitment to preserving, managing, and optimizing one of our planet's most precious resources – water.

The journey commences with the exploration of the hydrological regime of the Uzh River under the complex interplay of backwater conditions [236]. In striving to mitigate risks in urban environments, this study probes the intricate dynamics of river systems and their interaction with urban landscapes.

Advancements in technology are showcased in the realm of water regulation and drainage. The evolution of modular systems within the humid zone's landscapes underscores the innovative potential to manage and control water flow in dynamic environments [237].

The quantitative assessment of water quality in the "Vidsichne" reservoir serves as a cornerstone of environmental stewardship. By delving into the intricate chemistry and biology of water bodies, this research [238] lays the foundation for informed decision-making in water resource management.

In the context of the digital age, a forward-looking perspective emerges. The role of Ukraine in the global trends of sustainable development is critically analyzed within the framework of the digital economy [239], reflecting the intricate interplay between technology and sustainability.

The biological treatment of wastewater is dissected as the phenomenon of bulking in activated sludge systems is scrutinized. Through this lens, the symbiotic relationship between microbiology and environmental engineering comes to light [240], with implications for sustainable wastewater treatment.

The section delves into the hydrogeological and ameliorative state of the Kilchen irrigation system territory, a testament to the multidisciplinary nature of environmental engineering. This study [241] echoes the broader imperative of harmonizing human activities with the natural environment.

From biomass to gases, sustainable processing takes center stage as the extraction of pollutants from flue gases through mechanical activation is investigated [242]. This speaks

to the confluence of chemical engineering, environmental science, and sustainability goals.

Rounding out the section is a methodological exploration, a blueprint for determining the availability of natural moistening for land reclamation needs. This research [243] underscores the intricate nexus of climate, hydrology, and land management.

In essence, this section reflects the interdisciplinary nature of hydrology, water management, and environmental engineering. It underscores the relentless pursuit of sustainable solutions in an ever-changing world, where the preservation of water resources and the environment stand as pivotal endeavors.

4.7. Ecology, renewable energy, and resource management

Within the tapestry of these proceedings lies a section dedicated to exploring the delicate balance between ecology, renewable energy, and resource management. The talks within this segment delve into the intricate dance between humanity and its environment, seeking sustainable harmony.

The Southern Bug River mouth ecosystem is unveiled in all its complexity, offering a snapshot of its current state [244]. Through meticulous study, the intricate web of interactions that sustains this ecosystem comes into focus, revealing insights into the challenges and opportunities for conservation and restoration.

Shifting gears, the energy dynamics of solar panels and inverters intertwine with the broader electric network. This study [245] scrutinizes the marriage of renewable energy and grid infrastructure, offering glimpses into the optimization and challenges of harnessing sunlight to power our lives.

In the world of fisheries, probiotic microorganisms find a place in the production technology of European grayling fish stock [246]. The intersection of biology and aquaculture is explored, illustrating how microorganisms can contribute to the well-being of aquatic ecosystems and sustainable fish farming.

Heap leaching emerges as a technique for extracting gold from oxidized ore, with the Belsu deposit as its backdrop [247]. This method, rooted in chemical engineering, showcases how modern technologies can unlock the value of mineral resources while minimizing environmental impact.

A focus on spatial development drives a quest to enhance indicators that illuminate the transformation of territories. Through thoughtful analysis, this research [248] offers insights into urban planning, land use, and the intricate relationships that shape the built environment.

In the heart of the Ukrainian Carpathians, the potential of biomass from forest residues takes center stage [249]. This exploration of regional green economy emphasizes the symbiotic relationship between sustainable forestry practices, economic growth, and environmental stewardship.

The section also delves into cadastral and landscape modeling of lakes, casting light on the role of proper resource management in sustaining natural beauty and recreational opportunities [250]. This approach demonstrates the synergy between ecological conservation and human enjoyment.

Lastly, the interplay between social and environmental features becomes apparent through an examination of minerals resources classification systems [251]. Intrinsic connections are forged between societal needs, resource extraction, and environmental protection, reflecting the complexity of resource management.

This section encapsulates the intricate tapestry of humanity's relationship with its surroundings. It shines a light on the sustainable pathways forward, where ecology, renewable energy, and resource management converge to shape a harmonious future.

4.8. Environmental science and sustainability

The section consists of 21 talks that address various environmental issues and solutions in the context of war and energy. The talks are grouped into four sub-sections: radiation pollution, energy production, environmental risk assessment, and ecological diversity.

The first sub-section focuses on radiation pollution caused by war and nuclear power plants. The talks in this sub-section present mathematical tools for restoring the surface distribution of radiation pollution based on remote measurement data [252, 253], a conceptual scheme for creating environmentally friendly Gd-containing neutron-absorbing nanocomposites [254], a factor-criterion model for selecting the optimal option for transforming the “Shelter” object into an environmentally safe system [255], and the formation of the carbonate system of circulating cooling water of the Rivne NPP and its influence on the surface waters pH levels of the Styr River [256]. These talks provide novel approaches and techniques for reducing the radiation exposure and contamination of humans and the environment.

The second sub-section focuses on energy production from various sources, such as nuclear, biogas, and nanocomposites. The talks in this sub-section present a neural network model of investment process of biogas production [257], perspectives of nuclear energy development in Ukraine on the global trends basis [258], and development of recommendations for improving the radiation monitoring system of Ukraine. These talks explore the feasibility, benefits, and challenges of different energy options for meeting the growing energy demand and reducing greenhouse gas emissions.

The third sub-section focuses on environmental risk assessment of water bodies [259, 260], soil [261], air [262], and natural ecosystems in the conditions of mineral deposits development, warfare [263], transportation of dangerous substances [264], and fuel and energy complex [265]. The talks in this sub-section present methods and tools for assessing environmental risk using mathematical models, innovative technologies [266], scientific and methodological approaches, decision-making support tools, environmental biomonitoring, satellite imagery [267], etc. These talks aim to identify, quantify, and manage the environmental hazards and impacts of various human activities.

The fourth sub-section focuses on ecological diversity of different organisms in response to environmental stressors, such as electromagnetic pollution, pesticides, urbanization, etc. The talks in this sub-section present studies on the impact of electromagnetic pollution on the phytocenotic diversity of the transcordon region [268], the coherence of the formation of containing and ore containing Precambrian formations Orikhovo-Pavlograd suture zone of the Ukrainian shield [269], ecological adaptations among spruce species along an environmental gradient in urban areas [270], impact of pesticides on the respiration of *Planorbarius* (superspecies) *corneus* s. l. *allospecies* from the Ukrainian river network [271], environmental safety of soil genetic horizons in the impact zone of Lviv city landfill [272], etc. These talks reveal the effects of environmental stressors on the structure, function, and evolution of different biological systems.

The section offers a comprehensive overview of the current state-of-the-art research on environmental challenges and solutions in the context of war and energy. The section also highlights the gaps and directions for future research in this field. The section is relevant and timely for researchers, practitioners, policy makers, and general public who are interested in or concerned about the environmental issues facing Ukraine and other regions.

4.9. Economic and business sustainability

Encompassing a diverse array of talks, this section delves into the intricate interplay between economic practices, business strategies, and sustainable development [273], illuminating pathways toward a sustainable future.

The transformation of Ukraine’s national financial system emerges as a pivotal discussion.

Through the lens of sustainability, this exploration [274] unravel novel strategies for integration, aligning economic structures with the principles of environmental and social equilibrium.

The concept of social responsibility takes center stage as its integration within business practices is examined. This inquiry [275] underscores the evolving role of corporations in driving sustainable development, reflecting a growing recognition of the interdependence between business success and societal well-being.

The section delves into the realm of forestry enterprises, dissecting their potential management for sustainable outcomes. By scrutinizing the efficiency of forestry practices, this study [276] offer insights into the conservation of vital natural resources.

The grain industry's investment and operational costs are harmonized through the lens of sustainable development theory. This paper [277] illuminate the complex dance between economic profitability and environmental stewardship within the agricultural domain.

A model-driven exploration into socio-economic systems' sustainable development processes enriches the section. By employing analytical tools, this study [278] unravel the intricate dynamics underpinning societal progress and resilience.

The creation of a favorable environment for organic production emerges as a critical precursor to agricultural sustainability. The study [279] within this section underline how policy instruments can shape agricultural practices to align with ecological and social well-being.

The multi-dimensional nature of Ukraine's sustainable development is meticulously dissected through a structural econometric lens. This study [280] paint a comprehensive picture of the nation's progress, considering its social, economic, and environmental facets.

Addressing the evolving landscape of investment, the assessment of ESG (Environmental, Social, and Governance) competitiveness takes center stage. The study [281] illuminate how enterprises can navigate the shifting expectations of new-generation investors, aligning financial success with sustainable principles.

The post-COVID-19 economic recovery process comes under scrutiny through the lens of Sustainable Development Goals (SDGs). This reseatch [282] navigate the dual challenge of economic rejuvenation while upholding the principles of sustainability.

The section concludes with a focus on the Black Sea Region's role in the global grain trade and the challenges that underpin its development [283]. The economic implications of regional trade dynamics offer insights into the complex balance between trade, sustainability, and economic growth.

As a collective, this section unveils a mosaic of economic and business strategies, each thread intricately woven into the fabric of sustainable development. These studies underscore that economic prosperity can indeed coexist harmoniously with environmental and social well-being.

4.10. Geospatial and technological applications for sustainability

This section delves into the realm of geospatial technology and innovative applications that hold the key to sustainable development in diverse domains. These talks navigate the convergence of technology and sustainability, offering insights into the transformative potential of cutting-edge solutions.

The development of a predictive and search system for amber stands as a testament to the fusion of technology with resource management. By harnessing advanced algorithms, this study [284] seek to optimize the exploration of precious resources while aligning with sustainable practices.

Exploring land use policy implementation at the local level, this section demystifies the conceptual and terminological intricacies. By elucidating the policy landscape, this study [285] contribute to the formulation of strategies that foster sustainable land management practices.

Mining tourism emerges as a catalyst for sustainable development, especially in industrial regions like Kryvyi Rih. This study [286] showcase how the fusion of heritage, industry,

and responsible tourism can pave the way for socio-economic progress while preserving local identities.

The integration of remote sensing in assessing military destruction and its aftermath in Ukraine opens new frontiers for data-driven analysis. The study [287] employ technology to unravel the consequences of conflict, spotlighting the interplay between security, resilience, and recovery.

Switching gears, the section delves into the characteristics of BlaBlaCar, a ridesharing giant that exemplifies a sustainable transport solution. This study [288] unravel the potential of the sharing economy to reshape urban mobility and mitigate environmental impacts.

Addressing the rational use of mineral resources and mining waste, this section highlights the symbiotic relationship between industry and environmental sustainability. The study [289] delve into innovative practices that minimize waste while optimizing resource utilization.

Technological innovation takes center stage with investigations into an energy-efficient screw oil press. By reimagining traditional processes, the study [290] underscore how technology can drive efficiency gains with far-reaching ecological implications.

The integration of GIS technologies for geodetic monitoring resonates with this section's overarching theme [291]. This study [292] unveil how geospatial tools offer real-time insights, shaping effective decision-making processes across diverse domains.

Geographical foundations of the sustainable development concept are examined from a paradigmatic level. This study [293] contextualize sustainable development within the fabric of geographic principles, unearthing the interconnectedness of space, environment, and human progress.

Optimized fuel values are scrutinized as a strategy for emission reduction. This study [294] explore the potential of fuel optimization to mitigate environmental impacts, showcasing how technology can revolutionize conventional energy practices.

Engineering analysis of transverse loading dynamics in rail transportation underlines the integration of technology into logistical processes. These studies [295,296] uncover insights into load-bearing dynamics, with implications for efficient and sustainable transportation.

Energy potential within high-altitude mining transport systems receives attention in this section. These explorations [297] unveil the latent energy resources within mining operations, offering novel strategies for sustainability in challenging environments.

The section culminates in a deep dive into pathophysiological mechanisms, unraveling how technology intersects with health science. These inquiries probe the physiological adaptation of gastric cardia mucosa underlining how scientific understanding can inform sustainable healthcare practices [298].

5. Conclusion

The vision driving ICSF 2023 is to establish a paramount interdisciplinary platform, uniting researchers, practitioners, and educators, to showcase and deliberate upon the latest innovations, emerging trends, concerns, practical challenges, and adopted solutions in the realm of sustainability.

We extend our sincere gratitude to the authors who submitted their papers and to the delegates for their enthusiastic participation and interest in ICSF as a conduit for sharing ideas and innovation. Our heartfelt appreciation also extends to the program committee members, whose unwavering guidance, dedication, and the invaluable contributions of peer reviewers have elevated the quality of the papers. The constructive critiques, improvements, and corrections they provided have significantly enriched the success of this conference. We also recognize the pivotal role of Morressier's developers, whose robust conference management system facilitated every stage of the process, from soliciting papers to coordinating peer reviews and crafting the conference proceedings volume.

A special acknowledgment goes to the session chairs, whose steadfast commitment to shaping the conference and its program has been exceptional. Their role has greatly contributed to the cohesive and productive flow of the conference sessions.

Furthermore, we express our gratitude to IOP Publishing for their generosity in waiving the APC payments for corresponding authors based in Ukraine. This initiative enables authors to publish open access without charge in the prestigious *IOP Conference Series: Earth and Environmental Science* journal (<https://iopscience.iop.org/journal/1755-1315>). Additionally, the submission extensions offered by IOP Publishing are a testament to their understanding of researchers' challenges and constraints, underscoring their dedication to fostering a supportive academic environment.

As we move forward, we anticipate exceptional presentations and insightful discussions that will expand our professional horizons. We hope that all participants find immense value in this conference and eagerly anticipate the prospect of reconnecting in a more convivial, light-hearted, and harmonious setting at ICSF 2024. The next installment in the series, the 5th International Conference on Sustainable Futures: Environmental, Technological, Social, and Economic Matters, is set to take place in May 2024 in Kryvyi Rih, Ukraine (<https://icsf.ccjournals.eu/2024/>).

Thank you all for being an integral part of ICSF 2023, and here's to a brighter, more sustainable future that we collectively strive to build.

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References

- [1] Semerikov S, Chukharev S, Sakhno S, Striuk A, Osadchyi V, Solovieva V, Vakaliuk T, Nechypurenko P, Bondarenko O and Danylchuk H 2020 *E3S Web of Conferences* **166** 00001 ISSN 25550403 URL <https://doi.org/10.1051/e3sconf/202016600001>
- [2] Semerikov S, Chukharev S, Sakhno S, Striuk A, Iatsyshyn A, Klimov S, Osadchyi V, Vakaliuk T, Nechypurenko P, Bondarenko O and Danylchuk H 2021 *E3S Web of Conferences* **280** 00001 URL <https://doi.org/10.1051/e3sconf/202128000001>
- [3] Semerikov S O, Chukharev S M, Sakhno S I, Striuk A M, Iatsyshin A V, Klimov S V, Osadchyi V V, Vakaliuk T A, Nechypurenko P P, Bondarenko O V and Danylchuk H B 2022 *IOP Conference Series: Earth and Environmental Science* **1049**(1) 011001 URL <https://doi.org/10.1088/1755-1315/1049/1/011001>
- [4] Semerikov S O, Chukharev S M, Sakhno S I, Striuk A M, Iatsyshin A V, Klimov S V, Osadchyi V V, Vakaliuk T A, Nechypurenko P P, Bondarenko O V, Danylchuk H B and Artemchuk V O 2023 4th International Conference on Sustainable Futures: Environmental, Technological, Social and Economic Matters *IOP Conference Series: Earth and Environmental Science*
- [5] Abdillah L A, Sari I N and Indriani D E 2018 *International Journal of Engineering and Technology(UAE)* **7**(3) 1463 – 1467
- [6] Yusupov K A, Rysbekov K B, Aben K K and Bakhmagambetova G B 2021 *Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu* **2021**(3) 14 – 18 URL <https://doi.org/10.33271/nvngu/2021-3/014>
- [7] Abuselidze G 2018 *Journal of Applied Economic Sciences* **13**(7) 1929 – 1938

- [8] Sinha A, Nikhil S, Ajin R S, Danumah J H, Saha S, Costache R, Rajaneesh A, Sajinkumar K S, Amrutha K, Johny A, Marzook F, Mammen P C, Abdelrahman K, Fnais M S and Abioui M 2023 *Fire* **6**(2) URL <https://doi.org/10.3390/fire6020044>
- [9] Alpatova O M, Garlinska A M and Bordyug N S 2019 *Hydrobiological Journal* **55**(1) 36–43 ISSN 0018-8166 URL <https://www.dl.begellhouse.com/journals/38cb2223012b73f2,51cfce8a0ce6f810,76e641502b94854f.html>
- [10] Phang F A, Pusppanathan J, Nawi N D, Zulkifli N A, Zulkapri I, Harun F K C, Khang A W Y, Alsayaydeh J A J and Sek T K 2021 *International Journal of Emerging Technologies in Learning* **16**(15) 78 – 90 URL <https://doi.org/10.3991/ijet.v16i15.23673>
- [11] Gurieiev V, Kutsan Y, Iatsyshyn A, Iatsyshyn A, Kovach V, Lysenko E, Artemchuk V and Popov O 2020 Simulating Systems for Advanced Training and Professional Development of Energy Specialists in Power Sector *Proceedings of the 16th International Conference on ICT in Education, Research and Industrial Applications. Integration, Harmonization and Knowledge Transfer. Volume II: Workshops, Kharkiv, Ukraine, October 06-10, 2020 (CEUR Workshop Proceedings vol 2732)* ed Sokolov O, Zholtkevych G, Yakovyna V, Tarasich Y, Kharchenko V, Kobets V, Burov O, Semerikov S and Kravtsov H (CEUR-WS.org) pp 693–708 URL <https://ceur-ws.org/Vol-2732/20200693.pdf>
- [12] Babenko V, Chebanova N, Ryzhikova N, Rudenko S and Birchenko N 2018 *Eastern-European Journal of Enterprise Technologies* **1**(3-91) 4 – 12 URL <https://doi.org/10.15587/1729-4061.2018.123461>
- [13] Bendík J, Cenký M, Cintula B, Beláň A, Eleschová v and Janiga P 2023 *Processes* **11**(1) URL <https://doi.org/10.3390/pr11010009>
- [14] Makarov V, Kaplin M, Bilan T and Perov M 2021 Modeling the Coal Industry Technological Development Considering Environmental Restrictions *Systems, Decision and Control in Energy II* ed Zaporozhets A and Artemchuk V (Cham: Springer International Publishing) pp 153–165 ISBN 978-3-030-69189-9 URL https://doi.org/10.1007/978-3-030-69189-9_9
- [15] Blinov I V and Parus Y V 2015 *Technical Electrodynamics* **2015**(4) 81 – 88
- [16] Neelgund G M, Bliznyuk V N, Pud A A, Fatyeyeva K Y, Hrehorova E and Joyce M 2010 *Polymer* **51**(9) 2000–2006 ISSN 0032-3861 URL <https://doi.org/10.1016/j.polymer.2010.02.038>
- [17] Kholoshyn I, Nazarenko T, Bondarenko O, Hanchuk O and Varfolomyeyeva I 2021 *Journal of Physics: Conference Series* **1840**(1) 012017 URL <https://doi.org/10.1088/1742-6596/1840/1/012017>
- [18] Moskalets V, Knyazyuk O, Bordiug N, Ishchuk O and Matkovska S 2023 *Scientific Horizons* **26**(6) 43 – 57 URL <https://doi.org/10.48077/scihor6.2023.43>
- [19] Orkhontuul B 2007 Analysis of truck dismounting process *2007 International Forum on Strategic Technology* pp 457–458 URL <https://doi.org/10.1109/IFOST.2007.4798630>
- [20] Kholoshyn I V, Mantulenko S V, Burman L V, Joyce A S and Sherick D 2022 *IOP Conference Series: Earth and Environmental Science* **1049**(1) 012075 URL <https://doi.org/10.1088/1755-1315/1049/1/012075>
- [21] Bendík J, Cenký M, Eleschová Ž, Beláň A, Cintula B and Janiga P 2022 Stochastic Concept for Modeling Distributed Energy Resources in Power Systems *2022 22nd International Scientific Conference on Electric Power Engineering (EPE)* pp 1–6 URL <https://doi.org/10.1109/EPE54603.2022.9814093>
- [22] Panayotov V, Panayotova M and Chukharev S 2020 *E3S Web of Conferences* **166** 06012 URL <https://doi.org/10.1051/e3sconf/202016606012>
- [23] Kiv A E, Soloviev V N, Semerikov S O, Danylchuk H B, Kibalnyk L O, Matviychuk A V and Striuk A M 2021 Machine learning for prediction of emergent economy dynamics III *Proceedings of the Selected and Revised Papers of 9th International Conference on Monitoring, Modeling & Management of Emergent Economy (M3E2-MLPEED 2021), Odessa, Ukraine, May 26-28, 2021 (CEUR Workshop Proceedings vol 3048)* ed Kiv A E, Soloviev V N and Semerikov S O (CEUR-WS.org) pp i–xxxi URL <https://ceur-ws.org/Vol-3048/paper00.pdf>
- [24] Krasnov V P, Orlov O O, Zborovska O V, Zhukovsky O V, Kurbet T V, Shelest Z M and Davydova I V 2018 *Nuclear Physics and Atomic Energy* **19**(4) 383 – 391 URL <https://doi.org/10.15407/jnpae2018.04.383>
- [25] Kuzev L, Kostadinov E, Damyanov T, Dedelyanova K and Hristov N 2014 Comparative experimental study of two grinding media *IMPC 2014 - 27th International Mineral Processing Congress*
- [26] Anistratenko V V, Furyk Y I, Degtyarenko E V and Anistratenko O Y 2017 *Ecologica Montenegrina* **13** 70 – 79
- [27] Demchenko V A and Demchenko N A 2015 *Russian Journal of Biological Invasions* **6**(2) 78–86 ISSN 2075-1125 URL <https://doi.org/10.1134/S2075111715020022>
- [28] Chernichko J I, Demchenko V A, Podorozhny S N, Zhmud M Y and Suchkov S I 2022 *IOP Conference Series: Earth and Environmental Science* **1049**(1) 012065 URL <https://doi.org/10.1088/1755-1315/1049/1/012065>
- [29] Denisenko V S and Slyn'ko V I 2015 *Journal of Computer and Systems Sciences International* **54**(1) 1–12

- ISSN 1555-6530 URL <https://doi.org/10.1134/S1064230714050050>
- [30] Sadovenko I O, Zahrytsenko A M, Podvihina O O and Dereviahina N I 2017 *Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu* 19 – 26
- [31] Derkach T M 2019 *Orbital* 11(3) 219 – 227 URL <https://doi.org/10.17807/orbital.v11i3.1395>
- [32] Dmytrenko V I, Zezekalo I G and Vynnykov Y L 2022 *IOP Conference Series: Earth and Environmental Science* 1049(1) 012052 URL <https://doi.org/10.1088/1755-1315/1049/1/012052>
- [33] Dubovkina I, Sigal O, Rikhter V and Nizhnyk N 2021 *Ukrainian Food Journal* 10(4) 828 – 839 URL <https://doi.org/10.24263/2304-974X-2021-10-4-15>
- [34] Yeremeyev I, Dychko A, Kyselov V, Remez N, Kravchuk S and Ostapchuk N 3919 *Latvian Journal of Physics and Technical Sciences* 56(4) 57–67 URL <https://doi.org/10.2478/lpts-2019-0025>
- [35] Filatiev M 2017 *Mining of Mineral Deposits* 11(2) 91 – 95 URL <https://doi.org/10.15407/mining11.02.091>
- [36] Jovanovic S, Gligoric Z, Beljic C, Gluscevic B and Cvijovic C 2014 *Arabian Journal for Science and Engineering* 39(6) 4529–4539 ISSN 2191-4281 URL <https://doi.org/10.1007/s13369-014-1173-9>
- [37] Grinchenko V S 2018 *Technical Electrodynamics* 2018 29 – 32 URL <https://doi.org/10.15407/techned2018.04.029>
- [38] Pihulevskiy P G, Anisimova L B, Kalinichenko O O, Panteleeva N B and Hanchuk O V 2021 *Journal of Physics: Conference Series* 1840(1) 012018 URL <https://doi.org/10.1088/1742-6596/1840/1/012018>
- [39] Korobiichuk I, Davydova I, Korobiichuk V, Shlapak V and Herasymchuk O 2020 The Influence of Geological and Anthropogenic Factors on the Change of the Water Quality Parameters in the Kamyanka River Within the City of Zhytomyr *Mechatronics 2019: Recent Advances Towards Industry 4.0* ed Szweczyk R, Krejsa J, Nowicki M and Ostaszewska-Lizewska A (Cham: Springer International Publishing) pp 476–486 ISBN 978-3-030-29993-4 URL https://doi.org/10.1007/978-3-030-29993-4_59
- [40] Mokhor V, Korchenko O, Honchar S, Komarov M and Onyskova A 2021 *E3S Web of Conferences* 280 09009 URL <https://doi.org/10.1051/e3sconf/202128009009>
- [41] Hristova T, Gabrovska-Evstatieva K and Evstatiev B 2021 *Journal of E-Learning and Knowledge Society* 17(1) 62 – 71 URL <https://doi.org/10.20368/1971-8829/1135420>
- [42] Hryhoruk P, Khrushch N and Grygoruk S 2020 Assessing the Investment Capacity of the Agricultural Sector: Case of Ukraine 2020 10th International Conference on Advanced Computer Information Technologies (ACIT) pp 183–187 URL <https://doi.org/10.1109/ACIT49673.2020.9208927>
- [43] Zinovieva I S, Artemchuk V O, Iatsyshyn A V, Romanenko Y O, Popov O O, Kovach V O, Taraduda D V and Iatsyshyn A V 2021 *Journal of Physics: Conference Series* 1946(1) 012011 URL <https://doi.org/10.1088/1742-6596/1946/1/012011>
- [44] Kovach V, Deinega I, Iatsyshyn A, Iatsyshyn A, Kovalenko V and Buriachok V 2019 Electronic Social Networks as Supporting Means of Educational Process in Higher Education Institutions *Proceedings of the International Workshop on Conflict Management in Global Information Networks (CMiGIN 2019) co-located with 1st International Conference on Cyber Hygiene and Conflict Management in Global Information Networks (CyberConf 2019), Lviv, Ukraine, November 29, 2019 (CEUR Workshop Proceedings vol 2588)* ed Fedushko S, Gnatyuk S, Peleshchyshyn A, Hu Z, Odarchenko R and Korobiichuk I (CEUR-WS.org) pp 418–433 URL <https://ceur-ws.org/Vol-2588/paper35.pdf>
- [45] Buratynskiy I, Nechaieva T, Shulzhenko S and Ivanenko N 2021 The Optimization of PV-plant's DC/AC Equipment Ratio Using the Non-linear Least-cost Model 2021 IEEE 3rd Ukraine Conference on Electrical and Computer Engineering (UKRCON) pp 358–362 URL <https://doi.org/10.1109/UKRCON53503.2021.9575720>
- [46] Zverkovskyy V M, Sytnyk S A, Lovynska V M, Kharytonov M M, Lakyda I P, Mykolenko S Y, Pardini G, Margui E and Gispert M 3918 *Ekológia (Bratislava)* 37 69–81 URL <https://doi.org/10.2478/eko-2018-0007>
- [47] Klimov S V and Klimova A V 2022 *IOP Conference Series: Earth and Environmental Science* 1049(1) 012038 URL <https://doi.org/10.1088/1755-1315/1049/1/012038>
- [48] Kukharenko V N, Fedosova A P, Kolgatin A G and Dosov V G 1992 *Khimicheskoe I Neftegazovoe Mashinostroenie* (5) 19 – 21
- [49] Komarova E V 2021 *Journal of Physics: Conference Series* 1840(1) 012010 URL <https://doi.org/10.1088/1742-6596/1840/1/012010>
- [50] Malanchuk Z, Korniyenko V, Malanchuk Y, Khrystyuk A and Kozyar M 2020 *E3S Web of Conferences* 166 02008 URL <https://doi.org/10.1051/e3sconf/202016602008>
- [51] Lysychenko G, Weber R, Kovach V, Gertsyuk M, Watson A and Krasnova I 2015 *Environmental Science and Pollution Research* 22(19) 14391–14404 ISSN 1614-7499 URL <https://doi.org/10.1007/s11356-015-5184-1>
- [52] Bessalov A V and Kovalchuk L V 2019 *Cybernetics and Systems Analysis* 55(5) 731–741 ISSN 1573-8337

- URL <https://doi.org/10.1007/s10559-019-00183-y>
- [53] Danylchuk H, Ivanylova O, Kibalnyk L, Kovtun O, Melnyk T, Serdiuk O and Zaselskiy V 2020 Modelling of trade relations between EU countries by the method of minimum spanning trees using different measures of similarity *Proceedings of the Selected Papers of the Special Edition of International Conference on Monitoring, Modeling & Management of Emergent Economy (M3E2-MLPEED 2020)*, Odessa, Ukraine, July 13-18, 2020 (CEUR Workshop Proceedings vol 2713) ed Kiv A (CEUR-WS.org) pp 167–186 URL <https://ceur-ws.org/Vol-2713/paper13.pdf>
- [54] Kuchanskyy V 2017 The application of controlled switching device for prevention resonance overvoltages in nonsinusoidal modes *2017 IEEE 37th International Conference on Electronics and Nanotechnology (ELNANO)* pp 394–399 URL <https://doi.org/10.1109/ELNANO.2017.7939785>
- [55] Zadiraka V K and Kudin A M 2017 *Cybernetics and Systems Analysis* **53** 978–985 ISSN 1573-8337 URL <https://doi.org/10.1007/s10559-017-9999-2>
- [56] Sinchuk O, Kupin A, Sinchuk I, Rohoza M and Plieshkov P 2020 *Mining of Mineral Deposits* **14**(3) 101 – 111 URL <https://doi.org/10.33271/mining14.03.101>
- [57] Smyrnova-Trybulska E, Morze N, Kuzminska O and Kommers P 2018 *Journal of Information, Communication and Ethics in Society* **16**(4) 381 – 400 URL <https://doi.org/10.1108/JICES-03-2018-0028>
- [58] Pysmennyi S, Chukharev S, Khavalbolot K, Bondar I and Ijilmaa J 2021 *E3S Web of Conferences* **280** 08013 URL <https://doi.org/10.1051/e3sconf/202128008013>
- [59] Lavrov E and Pasko N 2018 *CEUR Workshop Proceedings* **2105** 445 – 448
- [60] Lazăr M, Faur F G, Dunca E and Ciolea D I 2017 *Environmental Engineering and Management Journal* **16**(6) 1301 – 1308 URL <https://doi.org/10.30638/eemj.2017.138>
- [61] Levkivskiy V, Lobanchykova N and Marchuk D 2020 *E3S Web of Conferences* **166** 05007 URL <https://doi.org/10.1051/e3sconf/202016605007>
- [62] Olytsky O, Yermakov V, Lunova O and Buglak O 2019 *Space Science and Technology* **25**(4) 48 – 56 URL <https://doi.org/10.15407/knit2019.04.048>
- [63] Ivanov M, Maksyshko N, Ivanov S M and Terentieva N 2020 Intelligent data analysis in hr process management *Proceedings of The Third International Workshop on Computer Modeling and Intelligent Systems (CMIS-2020)*, Zaporizhzhia, Ukraine, April 27-May 1, 2020 (CEUR Workshop Proceedings vol 2608) ed Subbotin S (CEUR-WS.org) pp 754–768 URL <https://ceur-ws.org/Vol-2608/paper57.pdf>
- [64] Malchenko S L, Tsarynyk M S, Poliarenko V S, Berezovska-Savchuk N A and Liu S 2021 *Journal of Physics: Conference Series* **1946**(1) 012010 URL <https://doi.org/10.1088/1742-6596/1946/1/012010>
- [65] Lezhnjuk P D, Kulik V V, Burykin O B, Malogulko J V, Kacejko P and Abenov A 2018 Transmission loss allocation for a bilateral contract in deregulated electricity market *Photonics Applications in Astronomy, Communications, Industry, and High-Energy Physics Experiments 2018* vol 10808 ed Romaniuk R S and Linczuk M International Society for Optics and Photonics (SPIE) p 1080865 URL <https://doi.org/10.1117/12.2501604>
- [66] Matsui A 2015 *Metallurgical and Mining Industry* **7**(1) 18 – 21
- [67] Souas F and Meddour A S E 2022 *Journal of Pipeline Science and Engineering* **2**(4) 100088 ISSN 2667-1433 URL <https://doi.org/10.1016/j.jpse.2022.100088>
- [68] Tovarovskii I G and Merkulov A E 2016 *Metallurgist* **60**(5) 589–593 ISSN 1573-8892 URL <https://doi.org/10.1007/s11015-016-0336-1>
- [69] Mytiai I S, Matsyura A V, Jankowski K and Mytiai Z 2020 *Ecologica Montenegrina* **38** 67–78 URL <https://doi.org/10.37828/em.2020.38.9>
- [70] Dura C, Păun A P and Moraru R I 2018 *Quality - Access to Success* **19**(162) 155 – 160
- [71] Pysmennyi S, Chukharev S, Kyelgyenbai K, Mutambo V and Matsui A 2022 *IOP Conference Series: Earth and Environmental Science* **1049**(1) 012008 URL <https://doi.org/10.1088/1755-1315/1049/1/012008>
- [72] Mykhailenko O and Budnikov K 2022 *IOP Conference Series: Earth and Environmental Science* **1049**(1) 012055 URL <https://doi.org/10.1088/1755-1315/1049/1/012055>
- [73] Yarkov S V, Nazarenko T H, Panteleeva N B, Bondarenko O V and Varfolomyeyeva I M 2022 *IOP Conference Series: Earth and Environmental Science* **1049**(1) 012036 URL <https://doi.org/10.1088/1755-1315/1049/1/012036>
- [74] Nazimko V 2018 *Acta Geodynamica et Geomaterialia* **15** 379 – 393 URL <https://doi.org/10.13168/AGG.2018.0028>
- [75] Nechypurenko P, Evangelist O, Selivanova T and Modlo Y O 2020 Virtual Chemical Laboratories as a Tools of Supporting the Learning Research Activity of Students in Chemistry While Studying the Topic “Solutions” *Proceedings of the 16th International Conference on ICT in Education, Research and Industrial Applications. Integration, Harmonization and Knowledge Transfer. Volume II: Workshops, Kharkiv, Ukraine, October 06-10, 2020 (CEUR Workshop Proceedings vol 2732)* ed Sokolov O, Zholtkevych G, Yakovyna V, Tarasich Y, Kharchenko V, Kobets V, Burov O, Semerikov S and Kravtsov

- H (CEUR-WS.org) pp 984–995 URL <https://ceur-ws.org/Vol-2732/20200984.pdf>
- [76] Kovalchuk L, Kaidalov D, Shevtsov O, Nastenka A, Rodinko M and Oliynykov R 2017 Analysis of splitting attacks on Bitcoin and GHOST consensus protocols *2017 9th IEEE International Conference on Intelligent Data Acquisition and Advanced Computing Systems: Technology and Applications (IDAACS)* vol 2 pp 978–982 URL <https://doi.org/10.1109/IDAACS.2017.8095233>
- [77] Osadchyi V V, Osadcha K P, Varina H B, Shevchenko S V and Bulakh I S 2021 *Journal of Physics: Conference Series* **1946**(1) 012022 URL <https://doi.org/10.1088/1742-6596/1946/1/012022>
- [78] Valko N V and Osadchyi V V 2021 *Journal of Physics: Conference Series* **1946**(1) 012016 URL <https://doi.org/10.1088/1742-6596/1946/1/012016>
- [79] Bondarenko O V, Hanchuk O V, Pakhomova O V, Tsutsunashvili G and Zagórski A 2022 *IOP Conference Series: Earth and Environmental Science* **1049**(1) 012076 URL <https://doi.org/10.1088/1755-1315/1049/1/012076>
- [80] Panayotova M 2000 *Surface and Coatings Technology* **124**(2) 266–271 ISSN 0257-8972 URL [https://doi.org/10.1016/S0257-8972\(99\)00647-7](https://doi.org/10.1016/S0257-8972(99)00647-7)
- [81] Kholoshyn I, Burman L, Nazarenko T, Mantulenko S and Panteleeva N 2020 *E3S Web of Conferences* **166** 13007 URL <https://doi.org/10.1051/e3sconf/202016613007>
- [82] Peremetchyk A, Kulikovska O, Shvahr N, Fedorenko S, Moraru R, Panayotov V and Chukharev S 2022 *Mining of Mineral Deposits* **16**(3) 67 – 77 URL <https://doi.org/10.33271/mining16.03.067>
- [83] Kuzmenko O, Petlyovany M and Heylo A 2014 Application of fine-grained binding materials in technology of hardening backfill construction *Progressive Technologies of Coal, Coalbed Methane, and Ores Mining* p 465 – 470 URL <https://doi.org/10.1201/b17547>
- [84] Popov O and Yatsyshyn A 2017 Mathematical Tools to Assess Soil Contamination by Deposition of Technogenic Emissions *Soil Science Working for a Living* ed Dent D and Dmytruk Y (Cham: Springer International Publishing) pp 127–137 ISBN 978-3-319-45417-7 URL https://doi.org/10.1007/978-3-319-45417-7_11
- [85] Ivanov R V, Grynko T V, Porokhnya V M, Pavlov R A and Golovkova L S 2022 *IOP Conference Series: Earth and Environmental Science* **1049**(1) 012041 URL <https://doi.org/10.1088/1755-1315/1049/1/012041>
- [86] Purskiĭ O I, Zholonko N N and Konstantinov V A 2000 *Low Temperature Physics* **26**(4) 278–281 ISSN 1063-777X URL <https://doi.org/10.1063/1.593899>
- [87] Komliev O, Bortnyk S, Remezova O, Spytzia R, Vasylenko S and Zhylykin S 2021 The use of data on the material composition of sediments during forecasting works of titanium root and placer deposits *20th International Conference Geoinformatics: Theoretical and Applied Aspects* URL <https://doi.org/10.3997/2214-4609.20215521163>
- [88] Sakhno I G, Molodetskyi A V and Sakhno S V 2018 *Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu* (5) 48 – 53 URL <https://doi.org/10.29202/nvngu/2018-5/4>
- [89] Sakhno S I, Yanova L O, Pischikova O V and Sergiienko T S 2022 *IOP Conference Series: Earth and Environmental Science* **1049**(1) 012050 URL <https://doi.org/10.1088/1755-1315/1049/1/012050>
- [90] Kryvenko P V, Sanytsky M and Kropyvnytska T 2018 Alkali-sulfate activated blended portland cements *Binders, Materials and Technologies in Modern Construction IV (Solid State Phenomena vol 276)* (Trans Tech Publications Ltd) pp 9–14 URL <https://doi.org/10.4028/www.scientific.net/SSP.276.9>
- [91] Zahorodko P V, Modlo Y O, Kalinichenko O O, Selivanova T V and Semerikov S O 2020 *CEUR Workshop Proceedings* **2832** 94 – 103
- [92] Semerikov S O, Teplytskyi I O, Soloviev V N, Hamaniuk V A, Ponomareva N S, Kolgatin O H, Kolgatina L S, Byelyavtseva T V, Amelina S M and Tarasenko R O 2021 *Journal of Physics: Conference Series* **1840**(1) 012036 URL <https://doi.org/10.1088/1742-6596/1840/1/012036>
- [93] Korobiichuk V, Shamrai V, Levytskyi V, Sobolevskyi R and Sydorov O 2018 *Rudarsko Geolosko Naftni Zbornik* **33**(4) 15 – 21 URL <https://doi.org/10.17794/rgn.2018.4.2>
- [94] Tarasenko R A, Usenko S A, Shapovalov Y B, Shapovalov V B, Paschke A and Savchenko I M 2021 Ontology-based learning environment model of scientific studies *Proceedings of the 9th Illia O. Teplytskyi Workshop on Computer Simulation in Education (CoSinE 2021) co-located with 17th International Conference on ICT in Education, Research, and Industrial Applications: Integration, Harmonization, and Knowledge Transfer (ICTERI 2021), Kherson, Ukraine, October 1, 2021 (CEUR Workshop Proceedings vol 3083)* ed Kiv A E, Semerikov S O, Soloviev V N and Striuk A M (CEUR-WS.org) pp 43–58 URL <https://ceur-ws.org/Vol-3083/paper278.pdf>
- [95] Shchokin V and Shchokina O 2015 *Metallurgical and Mining Industry* **7**(2) 11 – 18
- [96] Shkarupylo V V, Tomičić I and Kasian K M 2016 *Journal of Information and Organizational Sciences* **40**(1) 145 – 152 URL <https://doi.org/10.31341/jios.40.1.7>
- [97] Cuevas K, Chougan M, Martin F, Ghaffar S H, Stephan D and Sikora P 2021 *Journal of Building Engineering*

- 44 102718 ISSN 2352-7102 URL <https://doi.org/10.1016/j.jobe.2021.102718>
- [98] Vladimirov V A, Ma_czka C, Sergyeyev A and Skurativskiy S 2014 *Communications in Nonlinear Science and Numerical Simulation* **19**(6) 1770–1782 ISSN 1007-5704 URL <https://doi.org/10.1016/j.cnsns.2013.10.027>
- [99] Poros M and Sobczyk W 2014 *Rocznik Ochrona Srodowiska* **16**(1) 386 – 403
- [100] Danchenko Y, Andronov V, Sopov V, Khmyrov I and Khryapynskyy A 2018 *MATEC Web of Conferences* **230** 03004 URL <https://doi.org/10.1051/matecconf/201823003004>
- [101] Stanytsina V, Artemchuk V, Bogoslavskaya O, Zaporozhets A, Kalinichenko A, Stebila J, Havrysh V and Suszanowicz D 2022 *Energies* **15**(19) 7215 ISSN 1996-1073 URL <https://doi.org/10.3390/en15197215>
- [102] Stoliarenko V, Chernova M and Yakovchuk O 2020 *E3S Web of Conferences* **166** 01005 URL <https://doi.org/10.1051/e3sconf/202016601005>
- [103] Shapovalova N, Rybalchenko O, Dotsenko I, Bilashenko S, Striuk A and Saitgareev L 2019 Adaptive Testing Model as the Method of Quality Knowledge Control Individualizing *Proceedings of the 15th International Conference on ICT in Education, Research and Industrial Applications. Integration, Harmonization and Knowledge Transfer. Volume II: Workshops, Kherson, Ukraine, June 12-15, 2019 (CEUR Workshop Proceedings vol 2393)* ed Ermolayev V, Mallet F, Yakovyna V, Kharchenko V S, Kobets V, Kornilowicz A, Kravtsov H, Nikitchenko M S, Semerikov S and Spivakovskyy A (CEUR-WS.org) pp 984–999 URL https://ceur-ws.org/Vol-2393/paper_328.pdf
- [104] Timchenko R A, Krishko D A, Holovko S I, Goodary R and Aniskin A 2022 *IOP Conference Series: Earth and Environmental Science* **1049**(1) 012032 URL <https://doi.org/10.1088/1755-1315/1049/1/012032>
- [105] Toderas M, Moraru R I and Popescu-Stelea M 2015 *Journal of Mining Science* **51**(3) 541–552 ISSN 1573-8736 URL <https://doi.org/10.1134/S1062739115030163>
- [106] Tomiczek K 2019 *IOP Conference Series: Earth and Environmental Science* **261**(1) 012055 URL <https://doi.org/10.1088/1755-1315/261/1/012055>
- [107] Merzlykin O V, Topolova I Y and Tron V V 2018 Developing of Key Competencies by Means of Augmented Reality at CLIL Lessons *Proceedings of the 1st International Workshop on Augmented Reality in Education, Kryvyi Rih, Ukraine, October 2, 2018 (CEUR Workshop Proceedings vol 2257)* ed Kiv A E and Soloviev V N (CEUR-WS.org) pp 41–52 URL <https://ceur-ws.org/Vol-2257/paper05.pdf>
- [108] Tsyganenko-Dzyubenko I Y, Ghandzyura V, Alpatova O, Demchuk L, Khomyak I and Vovk V 2023 *Ekolohichni nauky* (1(46)) 53–58 URL <https://doi.org/10.32846/2306-9716/2023.eco.1-46.9>
- [109] Panchenko L F, Vakaliuk T A and Vlasenko K V 2020 Augmented reality books: concepts, typology, tools *Proceedings of the 3rd International Workshop on Augmented Reality in Education, Kryvyi Rih, Ukraine, May 13, 2020 (CEUR Workshop Proceedings vol 2731)* ed Burov O Y and Kiv A E (CEUR-WS.org) pp 283–296 URL <https://ceur-ws.org/Vol-2731/paper16.pdf>
- [110] Demeuov A, Tilekova Z, Tokpanov Y, Hanchuk O, Panteleeva N and Varfolomyeyeva I 2021 *E3S Web of Conferences* **280** 11010 URL <https://doi.org/10.1051/e3sconf/202128011010>
- [111] Vlasenko K, Hrudkina N, Reutova I and Chumak O 2018 *Eastern-European Journal of Enterprise Technologies* **3**(1-93) 51 – 59 URL <https://doi.org/10.15587/1729-4061.2018.131766>
- [112] Zotsenko M, Vynnykov Y, Doubrovsky M, Oganessian V, Shokarev V, Syedin V, Shapoval S, Poizner M, Krysan V and Meshcheryakov G 2013 Innovative solutions in the field of geotechnical construction and coastal geotechnical engineering under difficult engineering-geological conditions of Ukraine *18th International Conference on Soil Mechanics and Geotechnical Engineering: Challenges and Innovations in Geotechnics, ICSMGE 2013* vol 3 p 2645 – 2648
- [113] Didora V, Romantschuk L, Kliuchevych M, Vyshnivskiy P and Matviichuk N 2023 *Scientific Horizons* **25**(12) 60 – 68 URL [https://doi.org/10.48077/scihor.25\(12\).2022.60-68](https://doi.org/10.48077/scihor.25(12).2022.60-68)
- [114] Shkitsa L, Yatsyshyn T, Lyakh M and Sydorenko O 2020 *IOP Conference Series: Materials Science and Engineering* **749**(1) 012009 URL <https://doi.org/10.1088/1757-899X/749/1/012009>
- [115] Shepiliev D S, Modlo Y O, Yechkalo Y V, Tkachuk V V, Mintii M M, Mintii I S, Markova O M, Selivanova T V, Drashko O M, Kalinichenko O O, Vakaliuk T A, Osadchyi V V and Semerikov S O 2020 *CEUR Workshop Proceedings* **2832** 84 – 93
- [116] Shevchuk S, Zaichenko S, Opryshko V and Adjebi A 2019 Determination of the Diagnostic System Inertial Parameters for Power Generating Station Combustion Engine *2019 IEEE 6th International Conference on Energy Smart Systems (ESS)* pp 88–91 URL <https://doi.org/10.1109/ESS.2019.8764170>
- [117] Zachosova N, Kutsenko D and Koval O 2022 *Financial and Credit Activity: Problems of Theory and Practice* **4**(45) 223 – 233 URL <https://doi.org/10.55643/fcaptp.4.45.2022.3819>
- [118] Baranov G, Komisarenko O, Zaitsev I O and Chernytska I 2021 S.M.A.R.T. Technologies for Transport Tests Networks, Exploitation and Repair Tools *2021 International Conference on Artificial Intelligence and Smart Systems (ICAIS)* pp 621–625 URL <https://doi.org/10.1109/ICAIS50930.2021.9396055>
- [119] Eremenko V S, Zaporozhets A O, Isaenko V and Babikova K 2019 Application of Wavelet Transform for

- Determining Diagnostic Signs *Proceedings of the 15th International Conference on ICT in Education, Research and Industrial Applications. Integration, Harmonization and Knowledge Transfer. Volume I: Main Conference, Kherson, Ukraine, June 12-15, 2019 (CEUR Workshop Proceedings vol 2387)* ed Ermolayev V, Mallet F, Yakovyna V, Mayr H C and Spivakovsky A (CEUR-WS.org) pp 202–214 URL <https://ceur-ws.org/Vol-2387/20190202.pdf>
- [120] Yorkina N V, Podorozhnyi S M, Velcheva L G, Honcharenko Y V and Zhukov O V 2020 *Biosystems Diversity* **28**(2) 181 – 194 URL <https://doi.org/10.15421/012024>
- [121] Kulyk M, Nechaieva T, Zgurovets O, Shulzhenko S and Maistrenko N 2023 Comparative analysis of energy-economic indicators of renewable technologies in market conditions and fixed pricing on the example of the power system of ukraine *Systems, Decision and Control in Energy IV: Volume I. Modern Power Systems and Clean Energy* ed Zaporozhets A (Cham: Springer Nature Switzerland) pp 433–449 ISBN 978-3-031-22464-5 URL https://doi.org/10.1007/978-3-031-22464-5_26
- [122] Stanytsina V, Artemchuk V, Bogoslavskaya O, Zinovieva I and Ridei N 2021 *E3S Web of Conferences* **280** 09012 URL <https://doi.org/10.1051/e3sconf/202128009012>
- [123] Zarich V N and Marchenko B G 2002 *Izvestiya Vysshikh Uchebnykh Zavedenij. Radioelektronika* **45**(8) 12 – 18
- [124] Kuzminska O 2021 *Educational Technology Quarterly* **2021**(3) 402–414 URL <https://doi.org/10.55056/etq.19>
- [125] Shapovalov Y, Shapovalov V, Tarasenko R, Bilyk Z, Shapovalova I, Paschke A and Andruszkiewicz F 2022 *Educational Technology Quarterly* **2022**(3) 216–231 URL <https://doi.org/10.55056/etq.40>
- [126] Kiv A, Semerikov S and Soloviev V 2021 *Educational Technology Quarterly* **2021**(2) 140–256 URL <https://doi.org/10.55056/etq.54>
- [127] Semerikov S, Osadchyi V and Kuzminska O 2021 *Educational Technology Quarterly* **2021**(4) 429–604 URL <https://doi.org/10.55056/etq.53>
- [128] Semerikov S 2021 *Educational Technology Quarterly* **2021**(1) 1–50 URL <https://doi.org/10.55056/etq.13>
- [129] Trubavina I, Vorozhbit-Gorbatyuk V, Shtefan M, Kalina K and Dzhus O 2021 *Educational Technology Quarterly* **2021**(1) 51–72 URL <https://doi.org/10.55056/etq.56>
- [130] Pinchuk N, Pinchuk O, Bondarchuk O, Balakhtar V, Balakhtar K, Onoprienko-Kapustina N, Shyshkina M and Kuzminska O 2022 *Educational Technology Quarterly* **2022**(2) 129–142 URL <https://doi.org/10.55056/etq.8>
- [131] Vakaliuk T, Spirin O, Korotun O, Antoniuk D, Medvedieva M and Novitska I 2022 *Educational Technology Quarterly* **2022**(3) 232–250 URL <https://doi.org/10.55056/etq.32>
- [132] Klochko O V and Fedorets V M 2022 *Educational Technology Quarterly* **2022**(4) 276–306 URL <https://doi.org/10.55056/etq.431>
- [133] Burov O Y and Pinchuk O P 2023 *Educational Technology Quarterly* **2023**(1) 58–68 URL <https://doi.org/10.55056/etq.435>
- [134] Shapovalov Y, Shapovalov V, Shapovalov B and Antonenko P 2022 *Educational Technology Quarterly* **2022**(2) 169–181 URL <https://doi.org/10.55056/etq.3>
- [135] Prokhorov O V, Lisovichenko V O, Mazorchuk M S and Kuzminska O H 2022 *Educational Technology Quarterly* **2022**(4) 366–387 URL <https://doi.org/10.55056/etq.430>
- [136] Vakaliuk T, Spirin O and Kontsedailo V 2021 *Educational Technology Quarterly* **2021**(1) 73–86 URL <https://doi.org/10.55056/etq.16>
- [137] Hrynevych L, Morze N, Vember V and Boiko M 2021 *Educational Technology Quarterly* **2021**(1) 118–139 URL <https://doi.org/10.55056/etq.24>
- [138] Vakaliuk T 2021 *Educational Technology Quarterly* **2021**(2) 257–273 URL <https://doi.org/10.55056/etq.17>
- [139] Martyniuk O O, Martyniuk O S, Pankevych S and Muzyka I 2021 *Educational Technology Quarterly* **2021**(3) 347–359 URL <https://doi.org/10.55056/etq.39>
- [140] Oleksiuk V and Oleksiuk O 2021 *Educational Technology Quarterly* **2021**(4) 605–616 URL <https://doi.org/10.55056/etq.36>
- [141] Burov O 2021 *Educational Technology Quarterly* **2021**(4) 689–700 URL <https://doi.org/10.55056/etq.43>
- [142] Kuchyn Y, Naumenko O, Vlasenko O, Lytvynova S, Burov O, Kucherenko I and Mykytenko P 2022 *Educational Technology Quarterly* **2022**(1) 73–87 URL <https://doi.org/10.55056/etq.10>
- [143] Kukharenko V, Shunevych B and Kravtsov H 2022 *Educational Technology Quarterly* **2022**(1) 1–19 URL <https://doi.org/10.55056/etq.4>
- [144] Gayevska O and Kravtsov H 2022 *Educational Technology Quarterly* **2022**(2) 105–114 URL <https://doi.org/10.55056/etq.7>
- [145] Iyer S S, Gernal L, Subramanian R and Mehrotra A 2023 *Educational Technology Quarterly* **2023**(1) 18–57

- URL <https://doi.org/10.55056/etq.29>
- [146] Vakaliuk T A, Chyzhmotria O V, Chyzhmotria O H, Didkivska S O and Kontsedailo V V 2023 *Educational Technology Quarterly* **2023**(1) 106–120 URL <https://doi.org/10.55056/etq.37>
- [147] Pinchuk O P and Luparenko L A 2023 *Educational Technology Quarterly* **2023**(2) 141–156 URL <https://doi.org/10.55056/etq.582>
- [148] Nechypurenko P P, Chernova M P, Evangelist O O and Selivanova T V 2023 *Educational Technology Quarterly* **2023**(2) 188–209 URL <https://doi.org/10.55056/etq.603>
- [149] Shapovalov Y B, Bilyk Z I, Usenko S A, Shapovalov V B, Postova K H, Zhadan S O and Antonenko P D 2023 *Educational Technology Quarterly* **2023**(2) 210–232 URL <https://doi.org/10.55056/etq.604>
- [150] Bilyk Z I, Shapovalov Y B, Shapovalov V B, Megalinska A P, Zhadan S O, Andruszkiewicz F, Dołhańczuk-Śródka A and Antonenko P D 2022 *Educational Technology Quarterly* **2022**(4) 328–346 URL <https://doi.org/10.55056/etq.433>
- [151] Vakaliuk T, Pilkevych I, Fedorchuk D, Osadchyi V, Tokar A and Naumchak O 2022 *Educational Technology Quarterly* **2022**(2) 143–151 URL <https://doi.org/10.55056/etq.1>
- [152] Yelemessov K K, Baskanbayeva D D, Sabirova L B and Akhmetova S D 2023 Justification of an acceptable modern energy-efficient method of obtaining sodium silicate for production in Kazakhstan *IOP Conference Series: Earth and Environmental Science*
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