

# Abstracts

**Tetiana Biloborodova**

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## **Feature engineering for specific purposes in histological image analysis**

In the field of medical image analysis, small datasets are a pervasive issue due to difficulties in acquiring sufficient images, thereby making it impossible to use traditional techniques. This problem is especially relevant for histological image analysis, including cervix histological image analysis. Moreover, there is no universal approach to influencing a model's ability to generalize well. Feature engineering helps to simplify the transformation of the initial image data and enhance model accuracy. The proposed approach is aimed at feature engineering for the next cervical disease grade classification. The proposed approach consists of the following steps: 1) region of interest (RoI) annotation and extraction; 2) RoI rotation; 3) patch extraction; 4) nucleus segmentation; and 5) nucleus and background feature extraction. For the research task, the cervix epithelium is annotated as a RoI using the Segment Anything Model by Meta. For the next analysis, binary masks and extracted RoI are rotated to horizontal orientation. Rotated masks are used to detect the epithelium's medial axis. Based on the medial axis, a piecewise curve is generated and used as a base for bounding box detection. Detected bounding boxes were applied to the image with a rotated RoI to extract patches. Extracted patches are processed to segment the nuclei. Processing includes image transformation to grayscale, unsharp masking, white noise removal, Euclidean distance transformation, applying the watershed algorithm, and nucleus extraction. The feature set is defined according to the previous research by Strauss et al., which showed the high discrimination ability of wavelet transformation features for classification purposes. The extracted nucleus and background patch features will be used for the next classification.

**Leonid Boshkov**

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## **Energy – Information – Love: fundamentals of sustainable development theories**

The well-known basic definition of sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” has been reinterpreted within a new paradigm. A new formula of sustainable development “Energy – Information – Love” has been applied that is capable to provide theoretically based quantitative representation of sustainability.

**Olena Dobrovska**

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## **The influence of green finance and renewable energy on emissions of harmful substances into the atmospheric air**

In recent years, the development of the concept of "green" finance, which consists in attracting and directing funds to support ecologically sustainable development and the fight against climate change, has become particularly widespread. One of the strategic directions for the use of "green" finance is the allocation of funds to the development of renewable energy. The analysis of the scientific output in this area showed that in recent years there had been an increase in the scientific community's interest in researching issues related to renewable energy and green financing. In particular, the main directions of research in this area were considered. The structure of global electricity generation was also analyzed, from which conclusions were drawn about the growth of the share of electricity obtained from renewable sources. At the same time, there is a reduction in electricity production from traditional sources. The purpose of the work is to study the influence of green financing and renewable energy on the volume of emissions of harmful substances into the atmospheric air. The information base for the research is data from the World Bank and the International Renewable Energy Agency.

**Pavel Donec**

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## **Dysergetics as a discipline about self-chaotization of order (based on metaphors and other language means)**

Synergetics is usually briefly defined as the science of self-generation of order from chaos. This process has, however, an opposite analogue - the self-chaotization of order (as well as the initialization of disorder from the outside), which can be called dysergetics. It has a lot of mechanisms and triggers, many of which are denoted in public

discourse with the help of usual metaphors and phraseologisms ("perfect storm", "metal fatigue", "domino effect", etc.). Some of them can be used to describe contemporary events in Ukraine, Europe and the world.

## **Zoya Eremenko**

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### **The excitation of surface plasmon-polaritons in graphene by electromagnetic field induced in dielectric disks using finite-element electromagnetic simulations**

The science and engineering of subwavelength light-matter interactions have moved to designing and fabricating nanostructures with desired optical properties. The flexibility associated with applying such nanostructures as advanced artificial two-dimensional materials (metasurfaces) opens new areas in optics and photonics. In particular, it allows one to construct components with previously unattainable characteristics. The combination of graphene and dielectric metasurfaces gives an excellent opportunity to obtain exotic electromagnetic properties. In contrast, metasurfaces with highly-localized electromagnetic fields offer a platform to enhance the interaction between the incident light and graphene and facilitate a deep modulation from terahertz to near-infrared frequencies. This project concerns the study of surface plasmon-polaritons propagation conditions that can be excited in a two-dimensional graphene layer on a nanostructured all-dielectric metasurface. The proposed metasurface is based on a dielectric nanoresonator metasurface unit cell loaded with a graphene layer. The metasurface has a significant advantage, such as having a set of electric and magnetic multipole modes with very high tunable Q-factor. Such a hybrid graphene-dielectric metasurface allows for studying enhanced light-matter interactions in graphene by the excitation of surface plasmon-polaritons, as well as controlling their fundamental characteristics. We demonstrate the excitation conditions of toroidal dipole modes in single or dielectric disks collected into trimer clusters. Such disks permit enhanced light-matter interaction and have the possibility to excite the surface plasmon-polaritons in graphene by electromagnetic field induced in dielectric disks. Such single or dielectric disks collected into trimer clusters can be the base to design the hybrid graphene-dielectric metasurfaces in order to increase the propagation length for surface plasmon-polaritons in graphene.

## **Kateryna Hubenko**

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### **Determination of structure and electronic properties of oxide nanocrystals: towards a microscopic understanding of their redox activity**

Redox-active nanocrystals (NCs) represent a particular class of theranostic nanomaterials, which are able to participate in redox reactions at the cellular level. The development of many diseases, including cancer, is currently associated with the impact of so-called oxidative stress, which is a consequence of excessive generation of reactive oxygen species (ROS) by the living cell. Examples are hydroxyl radicals, superoxide anions, peroxide hydrogen, and singlet oxygen. It is known that small amounts of ROS play a key role in the processes of cell metabolism, and their concentration is controlled by a specific pro-/anti-oxidant system of the cell. However, stressors or environmental factors can destroy the cell's defense system causing ROS over-generation, which in turn causes cell membrane, DNA or protein damages and, consequently, the development of a number of diseases. Conventional methods of correction are based on a prevention and elimination of ROS effects by natural anti-oxidants, such as vitamin E, vitamin C, lycopene and others, which convert/neutralize them into water and oxygen. However, most of these compounds have low efficacy due to instability, poor cell permeability and low solubility. The approach of using redox-active NCs for the correction of disorders associated with ROS is promising and relevant, and active search for other self-regenerating anti-oxidants based on inorganic NCs represents a topical research field. In general, the ability to generate or scavenge ROS (the so-called pro- or antioxidant activity) directly depends on the NCs' defect structure, the presence of ions with variable valence in the crystal lattice and a number of other factors. There is however a severe lack of knowledge on the microscopic mechanisms of their pro- or antioxidant reactions. That is why, the aim of this project is the elucidation of the impact of structure, element composition (concentration of ions with lower valence states) and structural defects such as oxygen vacancies on their pro- or anti-oxidant action. My studies shall provide strategies for the creation of nanomaterials with controlled pro- or anti-oxidant properties, as well as develop ways to control the regeneration of the anti-oxidant action of NCs.

## **Mariia Ivanytska**

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## **Ukrainian literature in Germany: the image of Ukraine in German-language literary translations and in literary studies**

Translations, including their paratexts, as well as literary studies or literary criticism about the source literature, contribute to the understanding of this literature by representatives of the target culture and add symbolic capital to the source literature. Ukrainian-German translations, especially in the Soviet era, contributed to the formation of some negative stereotypes about Ukraine and displayed several manipulative strategies. The author analyzes a specific period of the translations of Ukrainian literature in the GDR and argues that during this period, literary relations between the Soviet Union and East Germany were clearly determined by ideology. Translations from Ukrainian into German created the image of Ukraine as part of the Russian-speaking cultural area and often established narratives that are still used today in information warfare.

**Kateryna Karpenko**

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### **Inclusiveness and Synergy of the Ecofeminist Interpretation of Ecocide**

The main idea of my paper is the assertion that the principle of inclusiveness is an important means of resisting modern Ecocide. In the conditions of aggravation of environmental problems, attention to modern ecofeminism is growing. This is because it is a combination of theory and practice of the struggle for inclusiveness. It is both a historical achievement of the ecofeminist movement and a theoretically grounded methodological postulate of the modern theory of ecofeminism. Any contrasts, exclusions, searches for a country, community, ethnic group, a country that suffers more from ecocide are methodologically incorrect and dangerous in practice. The inclusiveness of the analysis of the phenomenon of ecocide activates the processes of synergy of efforts of different countries and communities, where women's voices are heard, considered, and involved in making fateful decisions.

**Volodymyr Khomenko**

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### **IR spectroscopy as a key to identifying Proterozoic organic material from pegmatites of Volyn (NW Ukraine)**

At the late stage of development of the Korosten pluton (Zhytomyr region, Ukraine), large cavities with a diameter of up to 20 m were formed in granite pegmatites. These cavities became home to a unique underground Proterozoic microecosystem, traces of which are preserved in the form of kerite (fibrous microfossils), buddingtonite (ammonium feldspar) and black opal containing organic matter (OM). Scanning electron microscopy studies have shown that most kerite samples are thread-like, with characteristic branching, up to millimeters in length. C and N isotope studies of buddingtonite and black opal indicate the probable biogenic origin of the OM. The presence of characteristic vibrations of the C-H, N-H, C-C and O-H bonds in the IR spectra of kerite and coexisting minerals made it possible to identify, in addition to simple organic compounds such as NH<sub>4</sub><sup>+</sup> and CH<sub>4</sub>, also large chitosan molecules, which clearly confirmed the biogenic nature of kerite. OM was also detected by IR spectroscopy in the spectra of single crystals of beryl, topaz and quartz, as a component of fluid inclusions. Textural arguments and phase equilibria indicate formation of the ecosystem in a late stage of the pegmatite evolution, at P-T conditions below ~100 MPa/150 °C. Fossilization was due to hydrothermal fluorine-rich waters, which silicified the outermost part of the organisms, thus preserving their 3D morphology. Organic N, released as NH<sub>4</sub>, was then incorporated into buddingtonite. The Volyn biota indicate that at 1.5 Ga complex forms of life existed in the continental deep biosphere, well above the microscopic level, including fungi-like organisms resembling eukaryotes.

**Oksana Khrystenko**

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### **Investigating gender indexicality of male identities**

The project focuses on the cross-cultural peculiarities of gender-indexical linguistic phenomena that refer to masculine identities directly/ indirectly and on the values that are relevant to male communities. The relevance of the project is determined by focussing on the following aspects: 1. Insufficient research of the communicative activities of males, which represent a research desideratum in the field of interactional gender linguistics. Despite of 50 years of linguistic gender studies, the research of male linguistic behavior compared to analogue studies of female interactions was not visible for some time. The invisibility of males in gender studies can be explained by the fact that they were "generally treated as a homogeneous group" (Kiesling 2007: 653). On the other hand, their linguistic

usage was seen within the scope of deficit theory as the opposite pole to “women’s powerless language” (Lakoff 1975: 77) and was “not seen as a salient topic for the investigation” (Coates 2013: 127). 2. The investigation of the verbalization of the cultural dimension masculinities in the communication of Austrian and Ukrainian males based on data that are hard to get. Analysis was based on the audio recordings of interactions that were conducted in all-male groups of students and craftsmen in Austria and Ukraine.

**Olena Komar**

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### **Echo Chamber Effect in Bad Belief Formation**

Bad beliefs are those that are formed without proper justification and contradict well-known expert opinions, as well as verifiable empirical sources (Levi, 2022). N. Levy's conclusions about the rationality of accepting bad beliefs can be revised by considering the echo chamber effect. I argue that an individual's group belonging, level of dependence, and self-assessment of social status significantly affect the ability to form beliefs and take responsibility. Echo chambers lead to unwarranted confidence in one's beliefs, but responsibility for the harmful consequences of these beliefs is significantly reduced in the group. In my talk, I will also show how propaganda exploits the affective side of cognition by triggering an emotional response and creating a psychological effect of confidence in the rightness that replaces the procedure of checking the epistemic reliability of beliefs. The echo chamber effect creates a substitute for the expert community, as mutual support for bad beliefs occurs through the mechanisms of reinforcing the group view that previously existed due to changes in attitudes toward information sources. The acceptance of bad beliefs formed in an echo chamber contradicts to the usual practice of responsible epistemic behaviour, which usually imposes on the individual an obligation to check information sources. This raises the methodological question of the appropriate way to assess such beliefs.

**Natalia Kondratenko**

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### **The integration of Ukrainian Slavic studies into the scientific space of Germany: the stereotypical perception of Germany and the real experience of Ukrainians**

Since February 2022, in connection with Russia's armed aggression in Ukraine, Ukrainian linguists were forced to seek refuge in European countries. The desire to continue scientific research determined the search for opportunities in universities in Europe. The most difficult situation arose for linguists who study Slavic languages. In European countries, in particular in Germany, Slavic studies was previously based mainly on the study of the Russian language. In modern conditions, it is necessary to find a new direction for the study of Slavic languages, in particular with the actualization of East Slavic studies. For Ukrainian linguists, there are new opportunities to realize the scientific potential, taking into account the change in the direction of research.

**Iryna Konovalova**

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### **Application of quantum chemistry methods to predict supramolecular architecture of halogen and amino substituted aromatic compounds**

The halogen and amino substituted aromatic compounds are key structural blocks of bioactive products, medically important compounds and organic functional materials. Therefore, the study of molecular and crystal structure of such a type of compounds has an immense importance. The method of crystal structure analysis using quantum-chemical calculations make it possible to study the energy structure of a crystal, evaluate the role of various types of intermolecular interactions including weak ones, and predict the supramolecular architecture of a crystal. The combination of experimental X-ray diffraction data and theoretical studies allows to obtain systematic fundamental knowledge about features of the influence of various types of intermolecular interactions. The expected results of the project should contribute to the further development of modern crystal engineering that is one of the most grow area of the pharmaceutical research.

**Anna Kornishchenko**

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### **Materials with nano- and microsized structural elements for applications in energy storage devices**

It is known that for renewable energy usage, storage systems are required to provide uninterrupted service and satisfy user demands. The majority of the storage systems currently in operation around the globe use lithium ion batteries. It is known, that electrode material morphology can influence significantly the battery characteristics, because of the fact, that the higher the surface area, the higher would be the rate of lithium insertion-extraction, and as a result, battery cells could deliver higher working power. Therefore, electrode material morphology engineering can be an effective strategy of the battery performance improvement. For that reason, in my current project I am concentrated on the establishing relationship between the morphology of the electrode active material and its electrochemical characteristics such as lithium storage capacity and life-cycle time.

**Yeliena Kovalska**

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### **Conducting empirical sociological web research with Ukrainians during the war: implementation experience in Ukraine and Germany**

Since the outbreak of a full-scale war in February 2022, the conduct of sociological research in Ukraine has received new challenges. The main problems were the accessibility of respondents due to internal and external forced migration, as well as the inaccessibility of part of the territory of Ukraine due to active hostilities and occupation. A separate methodological problem is the lack of reliable data on the general population of Ukraine. In this situation, the use of the web research method is gaining particular relevance. During 2022 and 2023, we conducted two web-based surveys in Ukraine and among Ukrainian war refugees in Germany. To interview Ukrainians on the territory of Ukraine, we used a web panel, and to interview Ukrainian military refugees in Germany, we used open recruiting in target groups on social medias. Both methods make it possible to describe the main trends in opinions, but do not provide a high level of representativeness.

**Larysa Kovbasyuk**

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### **War metaphors in political language: a contrastive study of Ukrainian and German**

The article refers to a study with the aim of analyzing war metaphors used in political language in contemporary Ukrainian and contemporary German during the war in Ukraine. This article addresses how the conceptual level of WAR is represented by culture-related metaphors in both the Ukrainian and the German worldviews. The structural-semantic features of the analyzed metaphors are described in detail, their conceptual analysis is carried out. It was possible to determine how war metaphors can be classified in relation to objects, their origin, and their structure. The pragmatic functions of the selected metaphors are examined. The comparison of the German-Ukrainian lexeme and phraseme pairs based on semantic similarities and differences made it possible to determine full, partial, and zero equivalence. In this respect, the material base consists of 175 Ukrainian and 95 German metaphors from February 2022 to July 2023. The material of the study comes from Ukrainian and German online dictionaries, digital newspapers, and magazines.

**Iryna Kravchenko**

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### **Thermoresponsive liquid crystals for transdermal drug delivery**

The search and development of new dosage forms of prolonged action is the most urgent problem of modern pharmacy. One such form is transdermal therapeutic systems based on naturally occurring compounds such as cholesterol esters and terpenoids. We have developed new thermosensitive liquid crystal systems that provide physiological temperature, which will facilitate the penetration of highly active drugs through the native skin.

**Olha Kraynyk**

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### **Prohibition signs in modern German**

Prohibiting in prohibition signs is viewed from a language-pragmatic point of view and represents a speech act with the illocutionary purpose of omitting a (speech) act. The perlocutive effect of the prohibition consists in the Refraining from a specific behavior of the recipient. The Utterance of prohibition is direct - explicit when meaning the statement from the meanings of linguistic units is perceived, or concealed – implicitly when the meaning of statement is derived from the meanings of linguistic units. Prohibiting in modern German is done by various means

of expression. The possibilities of expression the explicit and implicit prohibition to speak depend on directive, assertive, commissive and expressive statement.

## **Olena Kyzymchuk**

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### **Design of the compression products and pressure level during motion**

The purpose of the project is to analyze the influence of certain product characteristics (design, shape, construction) and material properties (interlooping, stretchability, tensile) on the benefits they create during physical activity of people and subsequent recovery of the body after certain diseases. The 4D body scanning data will be transformed into processing data software and developed algorithm will be the main step for the individual design of knitted compression products according to the patient`s needs.

## **Maryna Kornet**

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### **Targeting advanced aminothioliol-based radioprotective agents derivatized by quinolines**

The project aims to create novel radioprotectors based on S-functionalized cysteamines: development of improved synthetic approaches towards the target compounds are targeted for progress in better understanding of the yet not completely clear action mechanism and structure-bioactivity relationship of radioprotectors. It is foreseen that the research of Dr. Kornet will boost cooperative interdisciplinary research on bioactivity between research groups with specialization in chemistry and biology, as well as participation in educational initiatives by transferring the most promising German educational practices to the Zaporizhzhia National University. The massive organic-chemistry expertise of the host, Prof. Thomas J.J. Müller's group, is expected to be highly beneficial for the fast development of the project and is complementary to the biological expertise brought in by the stipend. The intensification of the German-Ukrainian scientific cooperation is distinguished as a global goal, together with an intensification of interdepartmental collaboration between the chemical and biological departments both in Germany and Ukraine.

## **Olha Malysheva**

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### **Building up a wildlife forensic pipeline for control of sustainable use of Ukrainian sturgeon population**

Ukrainian sturgeons are on the brink of extinction. Poaching and illegal trade are the main reasons for their dramatic decline. This project will develop forensic tools to control trade in Ukrainian caviar and sturgeon meat. We are searching for river-specific genetic markers for sturgeon species, separating fish from the Don and the Dnepr and the Danube and the Rioni. The data obtained can be used to identify native individuals for release programs from Ukrainian hatcheries into the wild. In addition, the data obtained will be useful for detailed identification of the source of poached eggs and meat.

## **Olena Matukhno**

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### **Comparative analysis of the implementation experience of the Monitoring, Reporting, Verification and Accreditation System for Emissions Trading in Ukraine and Germany**

The tasks of the research are to make a comparative analysis of the experience of EU Emissions Trading System (ETS) Monitoring, Reporting, Verification and Accreditation (MRVA) implementation in Ukraine and Europe (using the example of Germany), and to develop recommendations for eliminating defects of the Ukrainian system. Because Ukraine was just on the first step of ETS implementation, especially the MRVA system, in this country, on the contrary of Germany, there is no differences in the norms and regulations of MRVA system for different industrial spheres. In all parts of Ukrainian industry MRVA has been applied according to the same law and algorithms of acting. However, as we can see in Europe, different industries request different approaches to their monitoring and reporting. One of the tasks of the research is the creation of recommendations for CO2 emissions monitoring, especially directed to the Ukrainian iron and steelmaking sector, taking into consideration all its specifications.

### **Rhetorical-communicative functions of W. Zelenskij's war speeches**

Russia's war against Ukraine is not only a war of annihilation, but also an information war. An important role in the fight against this information terror of Russia is played by the speeches of Ukrainian President Volodymyr Zelensky, who is trying to convince the world community, and through their politicians, to support Ukraine. We can already see that these speeches are convincing, because the support of the world community is growing steadily. The analysis of Volodymyr Zelensky's war speeches is intended to show their rhetorical-communicative functions, which are realized with the help of the language.

### **Accumulation of differential cross-level settlements and voids along the sleeper in railway ballast bed with wide and conventional sleepers**

The classic railway superstructure form separate sleepers in the ballast bed, due to its flexibility and maintainability is still the predominant type of superstructure. The early detection of unsupported sleepers, development prediction, and prevention of local instabilities can increase the reliability and availability of the ballasted track as well as reduce the lifecycle costs. It is the research aim of the present project. The achievement of the aim is impossible without the fundamental research of the ballasted track short- and long-term behavior with unsupported sleepers.

### **Molecular mechanisms of transdermal penetration of novel terpenoid prodrugs with anti-infective activity**

In the current project, we propose a synthetic prodrug design based on mono-/bicyclic terpenoids conjugated to existing anti-infective drugs. Being compounds of natural origin, terpenes serve as environmentally friendly chemical penetration enhancers (PE) along with their considerable inherent antiviral, antibacterial, antifungal action. Terpenes have shown an increase in the delivery of small-molecule drugs into the skin, due to their ability to interact with the intercellular lipids, producing extraction, fluidization, disorder, and separation. Thus, we plan to apply the prodrug approach to conjugate anti-infective agents to mono/bicyclic terpenoids using the latter as a versatile scaffold. Structure of the following anti-infectives will be modified according to the proposed approach: antibiotics – quinolones,  $\beta$ -lactams, sulfonamides; antifungals – azoles (imidazoles, triazoles), pyrimidine analogs. Conjugation will be carried out with mono- and bicyclic terpenoids such as verbenone, menthone, carvacrol, pulegone, borneol, eugenol, etc. We anticipate the following benefits from the resulting terpenoid prodrugs: increased solubility and lipophilicity; prolonged activity of anti-infective compounds; synergistic effect; increased chemical stability. For the obtained terpenoid prodrugs, various methods of administration might be used in the future. However, first we will focus on transdermal delivery and topical application of synthesized derivatives to treat the skin and soft tissue infections caused by diverse microorganisms – most commonly bacteria, but also fungi and viruses. The most complicated cases correspond to acute bacterial skin and skin structure infections triggered by *Streptococcus aureus* and *Streptococcus pyogenes*, as well as *Enterococcus faecalis* and Gram-negative bacteria such as *Acinetobacter baumannii*.

### **Narrating the War in religious context: Russia's invasion in testimonies of Ukrainian Evangelicals**

The personal stories of survival the occupation and mass shelling caused by the Russian invasion of Ukraine are recently becoming a popular genre among Ukrainian evangelicals. These testimonies have become embedded in the canvas of worship services or recorded in separate interviews spread through public Christian media channels. The testimonies usually focus on the war experiences and reflections on the basic religious values and attitudes helping to cope with the trauma caused by the war. The war-witnessed narratives tend to enrich the everyday theology of

Evangelicals while helping them to (re)construct the world up to new “normality” of the war, reinforcing well-known Bible-based notions and strengthening collective identities of the religious community.

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## **Oksana Pashko**

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### **Scandal and literature: how did Ukrainian futurism Mykhail` Semenko do it?**

The paper analyzes the strategy of the writer's become a famous due to the scandal. Two “scandalous” attempts of the Ukrainian futurist Mykhail` Semenko (1892 - 1937) are described, which were realized in different literary, historical, and political conditions. The first attempt was made in the 1910s, during the formation of modern discourse in Ukraine, the second - in the 1920s - during the formation of Soviet cultural policy in Ukraine. An attempt was made to reconstruct the mechanisms of “scandalous” literary behavior on its consequences.

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## **Olena Pchelintseva**

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### **Verbal nouns in Slavic languages: functional and semantic changes**

Verbs and nouns are considered a universal opposition in the languages of the world. Parts of speech are organized into center and peripheries with transitional zones. A prominent case of such a transitional category is action nouns, i.e. classes of nouns that are derived from verb stems with certain suffixes and that denote the same situation types (events, activities, states) as do their base verbs. Slavic aspect (i.e. the perfective/pfv. – imperfective /ipfv. opposition) is based on stem derivation, and since action nouns belong to the periphery of the grammatical system we may assume that action nouns in contrast to finite forms, are integrated late into aspect distinctions. They supply an ideal playground for the study of the development and inner-Slavic differentiation of aspect systems, in particular when different Slavic, as genealogically related, languages are compared, both in their contemporary stage and in diachrony. In the report I will present the results of our preliminary study of Ukrainian, Polish, Czech and Bulgarian action nouns in a comparative typological perspective.

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## **Nataliya Petlyuchenko**

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### **Synergy of charisma in Ukrainian war discourse (Volodymyr Zelensky, Oleksiy Arestovich, Vitaliy Kim)**

This presentation focuses on the synergistic media effect of charisma in Ukrainian military discourse using the example of three different 'opinion leaders' - Volodymyr Zelensky, Vitaliy Kim and Oleksiy Arestovych. Their charismatic appeals to Ukrainians in the early days of the war had a reinforcing impact through their indirect discursive interaction in the media and served both to support the morale and fighting spirit of Ukrainians and to convey messages to foreign allies that Ukraine could succeed in this war and would continue on their path to victory.

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## **Mariana Romanenko**

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### **Targeting metabolic risks: biorhythms, nutrition, and the gut microbiome**

The prevalence of metabolic diseases such as obesity and type 2 diabetes increases worldwide, leading to premature aging and disabilities. Rapid urbanization, an obesogenic environment, and an aging population are key factors in the etiology of metabolic diseases. However, the metabolic effects of circadian disruption caused by night activities, late and insufficient sleep, and unhealthy eating pattern are often underestimated. The aim of the project is to investigate how the parameters of circadian profile (chronotype, presence of social jetlag, and sleep quality) as well as eating rhythm affect nutrition, the gut microbiome, and human metabolism. Overall diet quality will be assessed using various indices. Healthy vs. unhealthy circadian profiles will be defined according to the associations with metabolic, inflammatory parameters, and dietary intake. The fecal gut microbiome of participants with healthy vs. unhealthy circadian profiles will be compared to determine the top bacterial taxa that contribute to potential associations.

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## **Nataliya Sadretdinova**

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### **Virtual design of inclusion supported garments with optimal ergonomic solutions**

In the world of military conflicts and dangerous diseases has adaptive clothing great significance, therefore it enables a normal life activity of impaired individuals in a social and physical rehabilitation environment. It is important by designing comfortable adaptive clothing, to have valid data on the anatomical alterations caused by the disease and to understand the specific of activities of people with disabilities. Significant variation in the mentioned factors is the reason why a one-off production approach to adaptive clothing design is common. The authors propose a new method to mass-produced design of adaptive clothing based on a via 4D-scanning obtained source data. The achieved results allows optimizing the garment construction in order to improve its ergonomics.

**Vitalii Shcherbinin**

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### **Low-loss dielectric-assisted cavity for terahertz gyrotrons**

Ohmic heating (losses) in all-metal interaction structures place a rigid limitation on efficiency and power of radiation sources operated in the terahertz (THz) frequency range, which is universally known as a THz power gap. Among these sources the most powerful is the gyrotron. In this study, a new low-loss dielectric-assisted cavity is considered as an alternative to conventional all-metal cylindrical cavities for terahertz gyrotrons. The cavity is equipped with distributed Bragg reflector (DBR) formed by a cylindrical sapphire tube and a hollow layer. The main function of the DBR is to shield the metal wall of the cavity from the field of the selected operating mode, which benefits from exceptionally low ohmic losses. Using the cavity of an existing 0.5-THz gyrotron as an example, it is shown that sapphire DBR enables many-fold power increase, which is favorable for bridging the THz power gap.

**Ievgen Solodkyi**

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### **Mo-based metal-matrix composites for high temperature application**

Metal-matrix composites (MMCs) are advanced materials and widely used in various fields of industry, where high physical, mechanical and functional properties are of vital importance. Mo-based alloys show great potential for ultrahigh-temperature applications because of their high melting points, high stiffness, and low coefficient of thermal expansion. However, the insufficient strength at elevated temperatures, low-temperature brittleness and poor oxidation resistance are the main concerns for Mo-rich alloys in practical use. Toward this end, fabricating Mo-based MMCs reinforced with multi-phase Mo-Si-B material and Ti<sub>5</sub>Si<sub>3</sub> ceramic particles have been aimed to solve the above-mentioned problems. Moreover, using of powder metallurgy technology makes it possible to obtained a uniform distribution of reinforcing particles in the molybdenum matrix as well as a fine-grained MMCs microstructure, which is a necessary condition for high mechanical characteristics.

**Inna Stupak**

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### **Understanding the productivity of derivational morphology: internal vs external factors**

The current project is dedicated to investigating the influence of both internal and external factors on the productivity of derivational morphology. Traditional approaches to measuring the productivity of derivational rules have had limitations, prompting the exploration of a novel method: utilizing distributional semantics. This study aims to employ quantitative computational semantics to shed light on why certain word formation rules generating names for new concepts maintain productivity, even when the referents of these concepts are not compositionally structured. Recent research has highlighted the significance of corpus-based embeddings, which are high-dimensional vectors representing word meanings, in addressing these complexities. However, existing embeddings have their shortcomings, partly due to their reliance solely on text data. To address this, the project will compare word embeddings based on non-conversational text corpus with pseudo-conversational speech transcriptions from television shows and movies. Given that many derivational processes involve abstract semantics, integrating visual grounding could significantly enhance the modeling of derivational semantics. This study thus explores the extent to which visual grounding can enhance quantitative models of productivity. So, a central topic in this line of research is to what extent visual grounding contributes to improved quantitative models of productivity. Therefore, the development of visually grounded embeddings for Ukrainian will be an essential part of this project. A pivotal aspect of this endeavor is the creation of visually grounded embeddings for Ukrainian, a novel approach that hasn't been utilized for studying morphological productivity before. It's anticipated that this innovative method will lead to further insights into productivity, offering enhanced precision when profiling the specifics of Ukrainian and German morphology.

### **Unraveling Feminization in the Ukrainian-German Dictionary by Z. Kuzelia and Ya. Rudnytsky: Navigating German Influence and Russian Departure**

This report examines feminine personal nouns documented in the 1943 Ukrainian-German dictionary by Z. Kuzelia and Ya. Rudnytsky, comparing them to the main Soviet-era Ukrainian explanatory dictionary (SUM-11). These analysis reveals distinct traditions in representing feminine terms in Ukrainian over the past century. One tradition, prevalent in mainland Ukraine, restricts feminine terms to colloquial usage due to the influence of Russian during the Soviet era. In contrast, diaspora dictionaries feature feminine derivatives more aligned with the language of the host country, as well as other Slavic languages, departing from the policy of Russification. I explore the implications of these two dictionary traditions on gender language policies in contemporary Ukraine.

### **Svitlana Telukha**

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#### **Holding the memory# Ukraine. Mapping, remembering and teaching the Holocaust after February 24th**

Ever since the beginning of the full-scale invasion of Ukraine by Russian troops, large numbers of people are dying, buildings and places of memory are being destroyed. Under such existential threat conditions, the mission of historians and researchers is to continue to preserve the memory of past events and to record the present for rethinking in the future. The war has not only greatly altered our personal and professional lives, but the way we understand and teach history. The purpose of my project is, therefore, not only to document sites of memory (lieux de memoire), but to trace the changes that the current war has inflicted on the culture of remembrance of World War II in Ukraine and Germany. In a first step, it aims at the digital preservation of the existing sites of memory to make them visible to a wider German and international audience. In a second step, it provide a better understanding of the changes in the policy of memory of the Second World War in the educational systems of Ukraine and Germany. I provide the mapping of the existing places of remembrance of the Second World War in Kharkiv, completed with information about the current condition of the monuments, their damage and current reconstruction works. Write new stories with survivors of the two wars of the Second World War and the current Russia against Ukraine. The theoretical aspect consists in tracing the changes in teaching the history of the Second World War in the educational institutions of Ukraine after February 24th 2022. The practical component is a series of interviews with teachers, museum workers, heads of various educational projects both in Ukraine and Germany in order to understand the situation from the inside. The questions I ask my storytellers are as follows: Did you discuss the day of February 24th 2022 in the classroom? Will the events in Ukraine today affect the way you teach the events of World War II? If so, in what ways? What changes in your professional activities have occurred since the beginning of the war in Ukraine? During the first months of the project I was able to meet my friends-witnesses of the Holocaust, who survived the Second World War and escaped the rocket attacks of the Russian military in 24.02.2022 and today Germany has provided them with comfort and warmth in the city of Duisburg. I was able to record unique interviews. Also during the meeting in Dresden I will be able to share the content of interviews with famous Holocaust researchers and teachers. I was able to make recordings with Anatoly Podolsky, Artem Kharchenko, Diana Eglitis, and other historians. I am excited to present the first results of the project among the conference participants and will be happy to be part of the event.

### **Nataliya Yadzhak**

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#### **Mechanical Properties of Fe-Ni-Al Alloys as a Foundation for Investigation of the Hydrogen Embrittlement Phenomenon**

Despite extensive studies on Fe-Ni-Al system, little attention has been paid to systematically describe the behaviour of the Fe-Ni-Al alloys in a hydrogen medium. In general, hydrogen diffuses and accumulates in metallic materials, influencing their properties, microstructure, and phase equilibrium. Moreover, the hydrogen influence differs depending on material, microstructure, type of specimens and charging conditions. The current study aims to investigate the microstructure and mechanical properties of body-centred cubic Fe-Ni-Al alloys, as well as the hydrogen effect on these properties at room temperature and elevated temperatures.

### **Problems and prospects of plant stress resilience**

The decision of a modern problem of plant resilience to biotic and abiotic stress under climate change is possible by different traditional and modern methods. Synergy and Entropy in the Ukrainian Scientific Landscape in Germany are discussed

**Liubov Zavalska**

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### **Ukrainian linguistic and country studies as a component of Ukrainian linguistic studies in Germany**

Research and study of the Ukrainian language in Germany requires a complex approach. The focus is not only on phonetics, vocabulary and grammar, but also information of a linguistic and regional nature. At the same time, it is important to present the events of modern culture and history of Ukraine to the German audience, introducing them into a linguistic context. First of all, it concerns the cultural heritage of Ukraine, important cities, national food and clothing. The postcolonial history of Ukraine and the place of the Ukrainian language among other Slavic languages should also be presented as a component of learning within each topic of studying the Ukrainian language at all levels (from A1 to C2). The basic concept of combining linguistic and linguistic material is the main principle of teaching the Ukrainian language for German speakers.

**Anatolii Zhuchok**

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### **Free Loday-type algebras**

The researcher's activity is aimed to solving modern problems of algebraic science. One of the most useful concepts in algebra is the free object and the congruence. The main purpose is to construct new free objects in some varieties of Loday-type algebras and characterize a series of the least congruences on them. The latter problem is equivalent to the classical word problem for relatively free algebras. The obtained results can be used in universal algebra and semigroup theory.

**Anatolii Tushev**

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### **On some applications of Algebra and Topology in natural and applied sciences**

Wavelets are one of the most interesting and useful objects in Modern Harmonic Analysis. The Fourier transform establishes a correspondence between the space generated by wavelets and the real group algebra of a torsion-free abelian group of finite rank. This allows us to apply the powerful methods of Commutative Algebra to the study of objects of Harmonic Analysis.

The concept of fractal dimension appeared in Topology for description of geometric structures which are called mathematical fractals. However, as it became known later, natural fractals also exist. For example, now the fractal dimension is very effectively used in studying various properties of geological structures. In particular, the fractal dimension allows us to describe the properties of subsidence of various geological structures.