**САРАТОВСКИЙ НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ**

**ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ ИМЕНИ Н.Г. ЧЕРНЫШЕВСКОГО**

Факультет гуманитарных дисциплин, русского и иностранных языков

Кафедра английского языка и межкультурной коммуникации

XVI научно-практическая конференция «Presenting Academic Achievements

to the World»

**08-09.04.2025**

**Саратов**

**Организационный комитет конференции**

**Председатель конференции**:

Фирсова Т.Г., директор Педагогического института, доцент кафедры начального языкового и литературного образования.

**Члены организационного комитета:**

**Председатели оргкомитета:**

Шилова С.А., декан факультета гуманитарных дисциплин, русского и иностранных языков, заведующий кафедрой английского языка и межкультурной коммуникации;

**Секретарь оргкомитета:**

Алексеева Д.А., доцент кафедры английского языка и межкультурной коммуникации;

**Председатель программного комитета:**

Сосновская А.А., доцент кафедры английского языка и межкультурной коммуникации; **Секретарь программного комитета:**

Пыжонков С.В., старший преподаватель кафедры английского языка и межкультурной коммуникации.

**Члены программного комитета:**

– Боц Т.С. – к.филол.н., доцент кафедры английского языка и межкультурной коммуникации

- Исайкина М.А. – к.пед.н., доцент кафедры английского языка и межкультурной коммуникации

- Косарева С.А. – к.пед.н., доцент кафедры английского языка и межкультурной коммуникации

– Сабитова Л.Р. – к.ист.н., доцент кафедры английского языка и межкультурной коммуникации;

– Сокиркина Л.И. – к.филол.н., доцент кафедры английского языка и межкультурной коммуникации;

– Смирнова А.Ю. – к.филол.н., доцент кафедры английского языка и межкультурной коммуникации;

– Уколова М.В. – преподаватель кафедры английского языка и межкультурной коммуникации;

– Кузьмина С.В. – к.соц.н., доцент кафедры английского языка и межкультурной коммуникации

- Богатенко Т.Р. – ассистент кафедры радиофизики и нелинейной динамики, инженер Учебной лаборатории радиофизики, преподаватель кафедры английского языка и межкультурной коммуникации

– Семенова Н.И. – к.физ.-мат.н., доцент кафедры радиофизики и нелинейной динамики

– Седова О.В. – к.биол.н., доцент кафедры ботаники и экологии

– Дрозд Д.Д. – к.хим.н., доцент кафедры общей и неорганической химии

– Максимова Е.А. – доктор пед. н., профессор кафедры английского языка и методики преподавания

– Булавина Е.В. – старший преподаватель кафедры информатики и программирования, заместитель декана факультета компьютерных наук и информационных технологий по социально-воспитательной работе

– Портенко М.С. – старший преподаватель кафедры информатики и программирования

|  |  |  |  |
| --- | --- | --- | --- |
| **March 4, Tuesday** | | | |
| **Event** | | | **Place** |
| **PRECONFERENCE EVENT** | | | |
| **Workshop:**  Clues to Impactful Public Speech and Poster  17.00 -18. 10 | | ***Presenter: Anna Yu. Smirnova*** (PhD in Literature, Assoc.Prof., Department of English Language and Intercultural Communication, SSU),  ***Anna A. Sosnovskaya*** (PhD inLinguistics, Assoc.Prof., Department of English Language and Intercultural Communication,SSU) | <https://telemost.yandex.ru/> |
| **April 08, Tuesday** | | | |
| 12.30-14.30 | **Panel Discussion 1: Physics and Mathematics** | | Building 12, Room 125 |
| 12:30-14:30 | **POSTER SESSION 1: Physics and Natural Sciences** | | Building 12, Room 126 |
| **April 09, Wednesday** | | | |
| 10:00-12:00 | **Panel Discussion 2: Natural Sciences** | | Building 8, Room 216 |
| 10:00-11:30 | **Panel Discussion 3: Pedagogics** | | Building 13, Room 24 |
| 13:50-15:20 | **Panel Discussion 4: Computer Science, IT and Economics I** | | Building 12, Room 125 |
| 15:30-17:10 | **Panel Discussion 5: Computer Science, IT and Economics II** | | Building 12, Room 125 |
|  | | | |

**Panel Discussion 1: Physics and Mathematics (Building 12, Room 125)**

**08 April, Tuesday 12:30-14:30**

**Time-limit: 7 minutes**

*Chairpersons:*

***Nadezhda I. Semenova*** *(PhD in Physics and Mathematics, Associate Professor, Department of Radiophysics and Nonlinear Dynamics, SSU)*

***Lyubov I. Sokirkina (****PhD in Philology, Associate Professor, Department of the English Language and Intercultural Communication, SSU)*

***Anna A. Sosnovskaya (****PhD in Philology, Associate Professor, Department of the English Language and Intercultural Communication, SSU)*

**Vitaliy Bogoyavlenskiy**

*Pattern Finding Algorithms*

The paper presents a new pattern discovery algorithm for ordered datasets compared with established methods. This task is vital for data analysis in finance, medicine and predictive analytics. The proposed matrix-based method employs matrix computations and graph theory to identify stable item combinations considering proximity. The mathematical foundations including support and frequency metrics are outlined. Complexity and efficiency analyses are provided. The new method shows promise for tasks requiring order and proximity considerations.  
*(Scientific Advisor: Sergey P. Sidorov, Doctor in in Physics and Mathematics, Associate Professor, Head of the Department of Theory of Functions and Stochastic Analysis, SSU)*

**Elizaveta Emelyanova**

*Correction of Recurrent Analysis Taking into Account the Prevailing Brain Rhythm in EEG Signals Using the Example of Cognitive Tests of People Suffering from Chronic Migraines*

The report deals with the modification of recurrence analysis that considers the predominant brain rhythms in EEG data analysis of individuals suffering from chronic migraines. The article describes the investigation of the relationship between shifts in alpha and beta rhythm distribution and the frequency of migraine attacks during cognitive tests. A comparison was made between standard and adjusted recurrence analysis, accounting for dominant frequencies. Findings indicate that in patients with frequent migraine attacks, predominant rhythms shift towards central brain regions, and the proposed diagnostic criterion achieves an accuracy of approximately 75%. These results may be used for predicting migraine attack frequency.

*(Scientific Advisor: Anton O. Selskii, PhD in Physics and Mathematics, Associate Professor, Department of Physics of Open Systems, SSU)*

**Aleksandr Kashichkin**

*Development of a Compact and Non-invasive Device for Monitoring Cardiorespiratory Parameters in Everyday Conditions*

Early diagnosis of diseases through sleep and vital signs monitoring is crucial for treating conditions such as Alzheimer's disease and sleep paralysis. This study aimed to develop a compact, non-invasive device for laboratory experiments on animals, providing accurate monitoring of vital signs and access to raw data. Existing commercial devices are designed for humans and offer only processed information. The developed system enables precise measurement of heart rate and blood oxygen saturation, facilitating more detailed diagnostics of sleep states. To evaluate the device, an experiment was conducted with a human subject at rest and during physical activity. Results were compared to data obtained from a Galaxy Watch 4. Applied filtering and smoothing methods ensured stable readings, generally aligning with the measurement range of the Samsung device. Future research will focus on integrating an accelerometer and machine learning algorithms to improve accuracy and expand capabilities for sleep studies in living organisms.

*(Scientific Advisor: Ivan V. Fedosov, PhD in Physics and Mathematics, Associate Professor, Department of Optics and Biophotonics, SSU)*

**Artem Khmyrov**

*Analysis of the Approach to Automatic Segmentation of Medical Images for Solving Biomechanical Problems in Traumatology and Orthopedics*

The report provides a comparative analysis of various approaches to marking radiographs performed under different conditions by specialists of various qualifications and unqualified specialists. The radiographs of patients with traumatological and orthopedic profile, made in the sagittal plane, were taken as the material. The X-ray images are used to mark the vertebrae by the participants of the experiment, divided into three groups: 1) biomechanics students, 2) professional orthopedic doctors, and 3) people who do not have qualified skills in this field. To quantify the difference between the markings, a measure of similarity is used using the following comparison methods: the Jaccard coefficient, the Kulchinsky coefficient, the Simpson coefficient, the Brown-Blanquet coefficient, the Otiai coefficient and the Sorenson coefficient. The result is an assessment of inter-expert reliability, sensitivity of various marking methods used under different conditions, as well as a comparative analysis of markings performed by participants of the experiment with different qualifications. The results of this study will serve as training data for a neural network in automated segmentation of medical images.

*(Scientific Advisor: Leonid V. Bessonov, PhD in Physics and Mathematics, Associate Professor, Head of Digital and Information Technology Office, SSU)*

**Nikita Lobanov**

*The Influence of Spin Current on Spin Waves in Magnetic Material-conductor Type Structures*

This research theoretically investigates the influence of the spin current generated due to the spin Hall effect in a conductor on magnetic material layers, particularly in ferromagnets and ferrimagnets where the spin wave propagates. Such structures are important for enhancing the efficiency of quantum electronics, as they can help to minimize the Joule heating. Micromagnetic modeling of wave processes and analysis of the obtained dispersion characteristics were carried out using YIG/Pt and Py/Pt bilayers as examples. The modeling was performed with the Boris Computational Spintronics program, which enables the calculation of approximate multi-physics dynamics of magnetization and simulates spin transfer. The main result of this study is the observed shift in the fundamental mode frequencies, which varies for different bilayers. Brillouin spectroscopy will be used in the planned experiments with bilayers of the magnetic material–conductor type.

*(Scientific Advisor: Maria A. Morozova, Doctor in Physics and Mathematics, Professor,*

*Department of Nonlinear Physics, SSU)*

**Pavel Lukyanov**

*Cryptography. RSA Protocols*

The RSA protocol is a widely used public-key cryptosystem in modern cryptography, enabling secure data transmission over insecure networks. It relies on the mathematical complexity of factoring large prime numbers for encryption and decryption, ensuring confidentiality and authenticity. RSA is fundamental in applications like SSL/TLS, digital signatures, and secure communications. Despite its robustness, challenges such as computational overhead and quantum computing threats drive ongoing advancements in post-quantum cryptography.

*(Scientific Advisor:* *Valery V. Krivobok, PhD in Physics and Mathematics, Associate Professor, Department of Computer Algebra and Number Theory, SSU)*

**Nataliya Nikishina**

*Wave Propagation in the Ring of Coupled FitzHugh-Nagumo Neurons in Presence of Lévy Noise*

The main model that demonstrates the work of real neurons is the FitzHugh–Nagumo neuron model. However, the effect of Lévy noise has not been extensively studied, while Lévy noise describes the changes of membrane potential of a neuron. A ring of coupled FitzHugh–Nagumo neurons under influence of Lévy noise was studied by numerical simulation. In this report, we consider positive and negative traveling waves that occur in the system. They were studied for different coupling strength and excitability threshold values. The research showed that positive traveling wave is resistant to Lévy noise, while negative traveling wave demonstrates transitioning between regimes when noise intensity is high. It is planned to expand the study by exploring the effect of delay on the dynamics of ring of FitzHugh-Nagumo neurons under the influence of Lévy noise. The results obtained could be indirectly used in medicine to stimulate neurons to reduce symptoms of certain diseases.

*(Scientific Advisors:* *Tatiana E. Vadivasova, Doctor in Physics and Mathematics, Professor; Andrei V. Bukh,* *PhD in Physics and Mathematics, Associate professor, Department of Radiophysics and Nonlinear Dynamics, SSU)*

**Dmitrii Panteleev**

*Use of Genetic Algorithms and Neural Networks in the Analysis of Foot Deformities*

This work addresses to investigate automated methods for diagnosing foot deformities using plantography and machine learning. The purpose of the study was to evaluate and analyze the effectiveness of automated methods for assessing footprints using “computer vision”. The study focuses on automatic recognition and marking of photoplantograms of the foot through genetic algorithms and neural networks. This approach is used to construct control points of the foot exemplified by calculating the indices of the longitudinal and transverse arches . A comparison was made between the results of calculating flatfoot indices and photoplantograms using manual and automatic markings. The findings revealed that the accuracy of automatic methods for analyzing photoplantograms using genetic algorithms and neural networks is 92–97% when compared to manual marking. Additionally, the time spent on manual marking was 2 to 2.5 times greater than one that required for automatic image analysis. The results confirm the potential for optimizing the diagnostic process during mass examinations of foot arch conditions.

*(Scientific Advisor:* *Inna A. Batraeva, PhD in Physics and Mathematics, Associate Professor, Head of the Department of Programming Technologies, SSU)*

**Oleg Pavlenko**

*Löwner equation*

The main object of the research is Löwner equation, which is a powerful tool for studying the properties of univalent functions. This equation generates a special curve on the graph. The form of this curve depends on a special part of the differential Löwner equation, called “forcing”. This forcing, by simple words, forces the generated curve to bend into different graph shapes. So, the Löwner equation draws a graph called “Löwner hall”. The result of the research is a Python program code that draws these “halls”.

*(Scientific Advisor: Andrei M. Zakharov, PhD in Physics and Mathematics, Associate Professor,*

*Department of Mathematical Analysis, SSU)*

**Sofiia Prikhodko**

*Spectral Properties of Second-order Operator Functions with Decaying Boundary Conditions*

The report examines the study of spectral properties of a class of second-order operator functions (or, in other words, operator pencils) with decaying boundary conditions. The eigenfunctions (e.f.) of the considered pencil, generated by a second-order differential expression and boundary conditions were studied. The conditions of twofold completeness and minimality of the system of e.f. in a given space were studied depending on the values of the parameters and coefficients. The conditions under which the system of e.f. is not complete and has an infinite defect were also explored. The result is the compilation of a computer program based on the obtained theoretical knowledge for studying the spectral properties of the e.f. of this pencil. In conclusion, the assessment of the achieved results is carried out and possible directions for further research are formulated.

*(Scientific Advisor: Victor S. Rykhlov, PhD in Physics and Mathematics, Associate Professor, Department of Differential Equations and Mathematical Economics, SSU)*

**Roman Shapoval**

*Possible Imaging of Hemodynamics Based on the Method of Incoherent Optical*

*Fluctuation Flowmetry*

The report presents the results of research focused on changes in the perfusion index of the cardiovascular system using methods for processing and converting biomedical signals. The relevance of the work allows us to estimate the perfusion index using imaging based on the conversion of the photoplethysmogram (PPG) signal and laser Doppler flowmetry (LDF).

The main part of the work consisted in the creation of software modules based on the incoherent optical fluctuation flowmetry method for processing experimental PPG data obtained using a CCD camera at wavelengths of 550 nm and 940 nm.

Based on the obtained research data, a theoretical model for converting PPG and LDF was tested, software modules for data processing were developed and imaging was constructed.

The results of the work can become part of the basis for the development of methods for processing biomedical signals, as well as the biomechanics of blood circulation.

*(Scientific Advisor:* *Sagaidachnyi A. Andrey,* *PhD in Physics and Mathematics, Associate Professor, Department of Medical Physics, SSU)*

**Denis Tkachev**

*Study of Intermolecular Interactions between Titanium Dioxide Clusters and Porphyrin Derivative Molecules*

Titanium dioxide can be used to coat photoanode in solar panels. This coating can increase the performance of the solar panel. This study aims to investigate the nature of intermolecular interactions between titanium clusters and porphyrin derivatives. The report presents the results of the first stage of the study received by the method of computational modeling. The objective of this stage was to determine which porphyrin interacts best with titanium clusters. Based on the results of the optimization, it can be stated that the porphyrin with a hydroxyl group interacts better with titanium dioxide clusters than the porphyrin with pyridine. It can also be concluded that titanium interacts with the porphyrin center better than with its substituted part. Though optimization provides only a part of the data, that allows us to understand whether it is reasonable to continue the study in this direction.

*(Scientific Advisor: Evgeny G. Glukhovskoy*, *PhD in Physics and Mathematics, Associate Professor, Department of Material Sciences and Technologies and Quality management, SSU)*

**Larisa Volkovoinova**

*The Influence of Laser Processing on Electrophysical Characteristics of Silicon*

The focus of this research is to investigate the effect of laser radiation on amorphous silicon, which is relevant for various fields of electronics. The report discusses the influence of silicon films laser processing on its electrophysical characteristics. To find this out, two kinds of bilayer structures on a glass substrate with a chromium sublayer were fabricated by magnetron sputtering: one of p-type silicon and the other of p-type silicon. To determine the effect of laser radiation, the structures were treated with infrared pulsed laser radiation, with different laser scanning speeds. A probe station helped to obtain the current-voltage characteristics of the radiated samples. The four-probe method was used to investigate the resistance of the radiated sections. The conducted study revealed that laser radiation has a significant effect on these electrophysical characteristics. Future research will focus on examining the influence of chromium or other metal substrate on the electrophysical characteristics.

*(Scientific Advisor: Alexey A. Serdobintsev***,** *PhD in Physics and Mathematics, Associate Professor, Department of Material Sciences and Technologies and Quality management, SSU)*

**Fyodor Voronin**

*Recurrent Neural Networks in Predicting Multidimensional Time Series*

In this work, we consider a method for predicting multidimensional time series in relation to the problem of predicting electricity prices. Accurate forecasting of electricity prices is critical for energy companies, consumers and market regulators.

The complexity of solving the problem of predicting electricity prices is due to the need to simultaneously take into account many factors in the forecast model factors such as: electricity supply and demand, weather conditions, seasonal factors, inflation, exchange rates, resource prices, energy generation data. The values of all the factors mentioned above are functions of time, and their totality can be represented as a multidimensional time series.

In this paper we propose to use an artificial recurrent neural network as a predictive model for multidimensional time series. The model is formed using recurrent LSTM layers of the Keras library and trained in the TensorFlow framework.

*(Scientific Advisor: Olga A. Myltsina, PhD in Physics and Mathematics, Associate Professor, Head of the Department of Theory of Functions and Stochastic Analysis, SSU)*

**Panel Discussion 2: Natural Sciences (Building 8, Room 216)**

**April 9, Wednesday, 10:00-12:00**

**Time-limit: 7 minutes**

*Chairpersons:*

***Olga V. Pavlova*** *(PhD in Pedagogics, Associate Professor, Department of the English Language and Intercultural Communication, SSU)*

***Oksana V. Sedova*** *(PhD in Biology,**Associate Professor, Department of Botany and Ecology, SSU)*

***Tatyana S. Bots****(PhD in Philology, Associate Professor, Department of the English Language and Intercultural Communication, SSU)*

**Viktoria Adushkina 2 место**

*Dependence of cognitive functions of mice on age and efficiency of photobiomodulation*

The report considers photobiomodulation (PBM) as a promising method for the prevention of early/moderate age-related cognitive impairment. However, the effectiveness of PBM remains unclear for elderly patients with significant age-related cognitive disfunction. The study showed a gradual increase in beta-amyloid (Aß) levels and a decrease of brain drainage with age, which, however, is associated with a decrease in cognitive function only in the elderly (at the age of 24 months) mice, but not in mice of average (12 months) and young (3 months) age. These age-related features are accompanied by the development of meningeal lymph vessel (MLV) hyperplasia in old mice, which causes the decrease of brain drainage. FBM improves cognitive functions and Aß clearance only in young and middle-aged mice, while older animals are insensitive to PBM. These results clearly demonstrate that the effect of PBM on cognitive functions correlates with age-related changes in the MLV network. The obtained results expand the fundamental knowledge about age-related differences in the effectiveness of PBM for improving cognitive functions and clearance of Aß.

*(Scientific Advisor: Oxana V. Semyachkina-Glushkovskaya, Doctor in Biology, Department of Human and Animal Physiology, SSU)*

**Eric Badalyan**

*Morphological description of some orchid species in the National Park Khvalynsky*

The full morphological description of the epipactis highleborine (L.) Crantz, epipactisatrrubens (hoffm.ex bernh.) Bess., Cephalathera Rubra (L.) Rich. within the National Park "Khvalynsky". An inventory was also carried out and the database of the Saratov State University and the Khvalynsky National Park was supplemented.

*(Scientific Advisor: Mikhail V. Lavrentiev, Associate Professor, Department of Botany and Ecology, SSU)*

**Boris Korenkov**

*Evolution of research on the catalyst of the oxidative ammonolysis of propylene*

The report examines the history of the formation of a modern industrial catalyst for the oxidative ammonolysis of propylene. Starting with the antimony catalysts of the first generations, continuing with the first polymetallic catalysts based on molybdenum, bismuth and silicon oxide. In the end, the main achievements of science on this topic are described today.

*(Scientific Advisor: Raisa I. Kuzmina, Doctor in Chemistry, Professor, Department of Petrochemistry and Technogenic Safety, SSU)*

**Yulia Kuliseva 1 место**

*Structure and morphological variability of natural and reintroduced populations of Calophaca wolgarica (L. fil.) DC.*

The report presents the results of analyzing *Сalophaca wolgarica* (L. fil.) DC. morphological variability and ontogenetic structure. The research of 21 natural populations on the territories of Volgograd and Rostov Oblast, the Republic of Kalmykia, Stavropol Krai was carried out, as well as five reintroduced populations on the territory of Saratov Oblast. The variability of 17 plant morphometric parameters was studied at the intra- and interpopulation levels depending on the environment factors. The specifics of age group ratio, vitality state were revealed.

*(Scientific Advisor: Alexander S. Kashin, Doctor in Biology, Professor, Department of Genetics, SSU)*

**Viktoriya Semikova**

*Variability of Atmospheric Aerosol Concentration in Saratov According to Satellite Observations*

The paper presents an analysis of the atmospheric optical thickness (AOT) variability, PM1, PM2.5 and PM10 concentration, wind speed and direction over Saratov in 2021-2024 years. The analysis was carried out for cases of significant increase in AOT. The wind direction during periods of increasing AOT values ​​mainly corresponded to the conditions for the aerosol particles release from the Central Asia deserts. The impact of atmospheric aerosol on the AOT over Saratov was estimated.

*(Scientific Advisor: PhD in Geography, Associate Professor, Department of Meteorology and Climatology, SSU)*

**Tatyana Shtyrova**

*Entomofauna of the Gorky City Park in Saratov*

The report examines the study of the entomofauna of city parks using the example of the Gorky City Park in Saratov. The studies were conducted in nature, using various insect collection techniques, such as mowing with a net, trapping, and direct observation. The methods of processing and storing the collected material were also considered. As a result of the work, the taxonomic and trophic structure of the population of terrestrial invertebrates in the city park of Saratov were established.

*(Scientific Advisor: Maxim Y. Voronin, PhD in Biology. Associate Professor, Department of Animal Morphology and Ecology, SSU*)

**Elizaveta Sokolova 3 место**

*Efficiency of photodynamic inactivation methods using photosensitizers on bacterial biofilm*

The goal of this report is to evaluate the efficiency of photodynamic inactivation methods and photosensitizers on single-species biofilms formed by Staphylococcus aureus. The research was conducted by cultivating biofilms in microtiter plate, staining with crystal violet and optical density measurement to quantify biofilm production. Also we performed the reductase test to assess the metabolic activity of biofilms. The findings were used for analysis of the results of photodynamic inactivation. The final stage was adaptation of this method for practical application in work with S. aureus.

*(Scientific Advisor: Elena S. Tuchina, Associate Professor, Department of Biochemistry and Biophysics, SSU)*

**Valeria Takaishvili 3 место**

*Influence of water environment quality on variation in the structure of plant communities of the Kurdyum river*

The study examines the impact of water quality on the structure of plant communities in the Kurdium River (Saratov Region). Research was conducted on the floristic composition of macrophytes and hydrochemical water parameters. It was found that both natural factors and anthropogenic loads influence water quality. Three groups of sites were identified based on the level of anthropogenic impact: upstream of the settlement, within the settlement, and along the highway. The results confirm the patterns of changes in plant communities under anthropogenic influence.  
*(Scientific Advisor: Olga N. Torgashkova, PhD in Biology, Associate Professor, Department of Botany and Ecology, SSU)*

**Irina Tazatkina**

Bacilli-produced poly-γ-glutamic acid as a base for creating hydrogels, which hold promise for biotechnology

As the title implies, the article discusses poly-γ-glutamic acid (γ-PGA) as a promising biopolymer synthesized by Bacillus bacteria for creating hydrogels due to its high hydrophilicity, biocompatibility, and ability to form stable structures. An overview of existing methods for producing γ-PGA-based gels, including combinations with other biopolymers such as gelatin, alginate, and starch, is presented to improve mechanical properties, biocompatibility, and biodegradability. Approaches to modifying γ-PGA to create hybrid materials with enhanced characteristics, particularly using the sol-gel process and mixing with chitosan, are also considered. The effects of these components on the mechanical properties, biocompatibility, and biodegradability of the resulting hydrogels are evaluated. The prospects of using γ-PGA-based gels in various fields are discussed. Experimental studies on synthesizing γ-PGA-based gels using various crosslinking methods and evaluating their physicochemical properties are planned. This will help identify optimal conditions for producing gels with specified characteristics.

*(Scientific Advisor: Svetlana A. Konnova, Doctor in Biology, Professor, Department of Biochemistry and Biophysics, SSU)*

**Matvey Tuzhilkin**

Method for real-time monitoring of brain activity in freely moving mice during wakefulness and natural sleep

Sleep plays a crucial role in maintaining health and brain function, but its restorative mechanisms remain poorly understood. The main challenge is the lack of methods for real-time monitoring of brain activity during natural sleep in animals. Most existing methods require head fixation, which causes stress and disrupts natural sleep processes. This complicates the study of the link between sleep and neurodegenerative diseases, such as Alzheimer's, where sleep disturbances contribute to the accumulation of toxic beta-amyloid. A new method developed for research on mice minimizes stress and enables real-time monitoring of brain activity during natural sleep. The method includes a head-fixing plate, a comfortable mattress, and a water delivery system, allowing mice to sleep in conditions close to natural. This opens new possibilities for studying brain clearance mechanisms of toxins and developing treatments for sleep disorders.

*(Scientific Advisor: Oxana V. Semyachkina-Glushkovskaya, Doctor in Biology, Department of Human and Animal Physiology, SSU)*

**Alyona Vidyapina**

*Photodamage to the Lymphatic Vessels of the Brain*

This work is aimed at studying the effect of photodamage of lymphatic vessels on the permeability of the blood-brain barrier, which is important for both scientific and practical medicine. The relevance of the topic is due to the growing interest in the mechanisms of brain clearance and disruption of the barrier function of the blood-brain barrier, which is an important aspect in understanding the pathogenesis of various diseases of the nervous system. A potential photostimulation technique is also being considered, which preliminary data suggest is capable of increasing lymphatic endothelial permeability and possibly influencing the blood-brain barrier, which may have significant therapeutic implications. Such studies may contribute to the development of new approaches in the therapy of neurological diseases and enhance the understanding of the functions of the meningeal lymphatic system.

*(Scientific Advisor: Oxana V. Semyachkina-Glushkovskaya, Doctor in Biology, Department of Human and Animal Physiology, SSU)*

**Denis Zheleznov**

Carbon Materials for Chemical Capacitive Energy Storage

Carbon materials have attracted intense interests as electrode materials for electrochemical capacitors, because of their high surface area, electrical conductivity, chemical stability and low cost. Activated carbons produced by different activation processes from various precursors are the most widely used electrodes. Recently, with the rapid growth of nanotechnology, nanostructured electrode materials, such as carbon nanotubes and template-synthesized porous carbons have been developed. Their unique electrical properties and well controlled pore sizes and structures facilitate fast ion and electron transportation. In order to further improve the power and energy densities of the capacitors, carbon-based composites combining electrical double layer capacitors (EDLC)-capacitance and pseudo-capacitance have been explored. They show not only enhanced capacitance, but as well good cyclability. In this report, recent progresses on carbon-based electrode materials are summarized, including activated carbons, carbon nanotubes, and template-synthesized porous carbons, in particular mesoporous carbons. Their advantages and disadvantages as electrochemical capacitors are discussed. At the end of this report, the future trends of electrochemical capacitors with high energy and power are proposed.

*(Scientific Advisor: Ivan A. Kazarinov, Doctor in Chemistry, Head of the Department of Physical Chemistry, SSU)*

**Panel Discussion 3: Pedagogics (Building 13, Room 24)**

**April 9, Wednesday, 10:00-11:30**

**Time-limit: 7 minutes**

*Chairpersons:*

***Elena A. Maksimova*** *(Doctor of Pedagogics, Professor, Department of the English Language and Methods of Teaching, SSU)*

***Maria A. Isaikina*** *(PhD in Pedagogics, Assoc.Prof., Department of English and Intercultural Communication, SSU)*

***Svetlana A. Kosareva*** *(PhD in Pedagogics, Associate Professor, Department of the English Language and Intercultural Communication, SSU)*

**Danila Viltsev**

*Requirements Analysis and Development of an iOS Application for Improving English Language Skills*

This report focuses on the development of an iOS application designed to enhance English language skills. The study begins with an analysis of existing language learning applications, identifying their advantages and limitations. Based on this analysis, functional and non-functional requirements for the new application are formulated. Key features include testing capabilities, interactive communication, grammar error detection, vocabulary learning using the Leitner system, and structured exercises. The application is developed using Swift and SwiftUI, with a microservice-based server-side implemented in Java and Python. PostgreSQL is chosen for data storage, and the system follows CI/CD principles for automated deployment. The server-side infrastructure is containerized using Docker and deployed on Timeweb Cloud. The proposed solution aims to improve the effectiveness of language learning by offering practical usage scenarios, automated grammar checks, and structured lessons.

*(Scientific Advisor: Yulia N. Kondratova, PhD in Physical and Mathematical Sciences, Department of Mathematical Cybernetics And Computer Sciences, SSU)*

**Anastasia Grigoryeva**

*Consideration of Individual Abilities in Game Learning*

In the learning process, it is important to notice individual abilities and develop them. The purpose of this article is to examine how game learning affects the identification and development of students’ individual abilities. The article says that when performing, it is important to create a sense of success, progress, as in games. You can turn a whole series of lessons into an exciting game. The main task of the teacher is to choose a game that corresponds to a certain type of lesson.

*(Scientific Advisor: Olga V. Pikulik, PhD in Pedagogy, Associate Professor, Department of Physics and Methodological Information Technologies, SSU)*

**Danil Malyukin**

*Comparison of Python, C# binary search algorithm for building digital competencies of 10th grade students*

The paper discusses the influence of a programming language for school education on the idea of basic data types and data structures. A binary search algorithm for sorted arrays is given as an example.

*(Scientific Advisor: Vitaly A. Veksler, PhD in Pedagogy, Associate Professor, Department of Information Systems and Technologies in Learning, SSU)*

**Nikita Peredreev**

*Analysis of the Compliance of IT Graduates’ Competencies with Employers’ Requirements in Web Development Introduction*

The article examines the competencies of IT graduates in web development and their alignment with employers' requirements. An analysis of key skills in demand on the modern labor market is conducted, including programming languages, frameworks, databases, and development methodologies. It is revealed that educational programs often lag behind rapid industry changes, creating a gap between graduates' knowledge and employer expectations. Recommendations are proposed to update curricula to enhance the competitiveness of specialists in the field.

*(Scientific Advisor: Natalia A. Alexandrova, PhD in Pedagogy, Dean of the Faculty of Physics, Mathematics, and Natural Sciences, SSU)*

**Leonid Polidorsky**

*Interactive Textbooks: the Future of Education Is Already Here*

The modern world is rapidly changing, and education cannot remain on the sidelines. Traditional textbooks, despite their time-tested value, are increasingly giving way to new, more dynamic, and engaging formats. Interactive textbooks are one of the most promising trends in education, offering a fundamentally new approach to learning and capable of transforming the educational process.

*(Scientific Advisor: Olga V. Pikulik, PhD in Pedagogy, Associate Professor, Department of Physics and Methodological Information Technologies, SSU)*

**Popadyuk Elizaveta**

*Inequalities in Olympiad Mathematics for Schoolchildren*

The relevance of the chosen topic is due to the very high importance of applying inequalities both in the field of mathematical sciences, as well as in economics, computer science, physics, and chemistry. If we talk about the more specific meaning of inequalities in applied mathematical problems, then inequalities are used, for example, when solving problems of mathematical statistics, studying functions: finding extremes, determining monotony, limitation, etc. In the school mathematics course, the topic of "Inequality" is considered in a rather concise volume, but when solving Olympiad problems, it is often necessary to be able to to operate with various facts and properties related to inequalities. Moreover, such tasks are found even in the age group of grades 5-7, although at this stage of education in the school mathematics course, the topic of inequalities is not explicitly considered, and students are familiar with only some basic facts from the theory of inequalities.

*(Scientific Advisor: Elena V. Razumovskaya, Associate Professor, Acting Head of the Department of Mathematical Analysis, SSU)*

**Alina Samsonova, Anna Tikhonova**

*The Use of Artificial Intelligence in Online Education*

This report investigates the transformative potential of artificial intelligence (AI) in online education. By integrating AI technologies, educational platforms can deliver personalized learning experiences, automated assessments, and real-time feedback, thereby enhancing student engagement and outcomes. Virtual assistants and chatbots provide continuous support, addressing student inquiries and offering motivational guidance. AI-driven analytics enable educators to predict student performance and implement targeted interventions, optimizing learning trajectories. Furthermore, AI facilitates the creation of interactive and accessible learning materials, accommodating diverse student needs and promoting inclusivity. The study underscores the critical applications and future trajectories of AI in the educational landscape, highlighting its role in revolutionizing pedagogical practices and improving educational accessibility.

*(Scientific Advisor: Liliya R. Sabitova, PhD in History, Associate Professor, Department of the English Language and Intercultural Communication, SSU)*

**Artyom Sakhipov**

*The Use of Innovative Methods in Teaching Physics in Secondary School*

The article examines the use of innovative methods in teaching Physics in secondary school. The emphasis is made on a fairy tale lesson as a type of non-traditional lesson. The author analyzes how the use of a fairy tale lesson helps to increase cognitive activity and develop creative thinking among students of the 7-8 grades. Fairy tale lessons make studying Physics more exciting, alongside they create an emotional connection with the educational material, what in its turn contributes to a better assimilation of physical concepts. The study shows that the integration of innovative methods into the educational process can significantly enrich students’ experience and increase their motivation to study Physics.

*(Scientific Advisor: Natalia G. Nedogreeva, PhD in Pedagogy, Associate Professor, Department of Physics and Methodological Information Technologies, SSU)*

**Anara Aimaganbetova**

*Theoretical Qustification of the Resource Approach*

The article discusses approaches to the study of the content of the concept of ‘‘resource approach’’. The author draws attention to the fact that in an educational organization the word ‘‘resource’’ is applied to various components of the educational process. Educational resources are both material and spiritual, as well as temporary means of developing human potential, the environment and human activities. The conditions that ensure the quality of modern education are temporary, informational, technological, motivational and innovative resources. At the same time, the teacher is always the main resource at any level of the educational system.

*(Scientific Advisor: Marina N. Burmistrova, PhD in Pedagogy, Associate Professor, Department of Educational Methodology, SSU)*

**Damir Aitimov**

*The Concept and Essence of the College Educational Environment*

The article discusses issues related to the formation of the educational environment as a set of external conditions in which the daily life of the student takes place. The educational environment is considered from the point of view of the opportunities available in it for the students development. In the pedagogical aspect, the environment is understood as a person’s surrounding, the conditions under which he or she interacts with this environment. These conditions have a certain impact on personality development and can activate or slow down the process of interaction in the educational process.

*(Scientific Advisor: Ekaterina A. Aleksandrova, Doctor in Pedagogy; Professor; Head of the Department of Educational Methodology, SSU)*

**Irina Kozlova**

*The Issues of Importance of Students’ Meta-subject Skills Development*

Students’ meta-subject skills are important because of their versatility, as they cover various aspects of academic and daily life. The article discusses issues related to the development of critical thinking, communication, decision-making skills, as well as creative thinking. The importance of meta-subject skills in developing the potential of students and creating a holistic picture of the world is outlined. The meta-subject approach is aimed at combining the mental, social and cultural development of students.

*(Scientific Advisor: Natalia G. Nedogreeva, PhD in Pedagogy, Associate Professor, Department of Physics and Methodological Information Technologies, SSU)*

**Panel Discussion 4: Computer Science, IT and Economics I (Building 12, Room 125)**

**April 9, Wednesday, 13:50-15:20**

**Time-limit: 7 minutes**

*Chairpersons:*

***Ekaterina V. Bulavina*** *(Senior Lecturer, Department of Informatics and Programming, Deputy Dean of the Faculty of Computer Science and Information Technologies, SSU)*

***Dina A. Alexeeva*** *(PhD in Philology, Associate Professor, Department of the English Language and Intercultural Communication, SSU)*

***Maria V. Ukolova*** *(Senior Lecturer, Department of the English Language and Intercultural Communication, SSU)*

**Polina D. Akishina**

*Developing a Scientific Conference Website Using Node.js*

The growing digitalization of scientific events requires efficient online platforms. This paper presents the development of a scientific conference website using Node.js, ensuring high performance and scalability. The system includes participant registration, authentication, submission of conference papers, and an administrator panel. MongoDB is used for database management, while Express.js handles server-side functionality. The resulting platform simplifies event organization and enhances user interaction. Future improvements include security enhancements and mobile compatibility.

*(Scientific Advisor: Marina S. Portenko, Senior Lecturer, Department of Informatics and Programming, SSU)*

**Milana M. Kudasheva**

*Development of a Mobile Application in Swift for Creating and Using a Scratch-Map for Traveling*

The report discusses the development of a mobile application in Swift for creating and using a Scratch-map for travel purposes. The application allows users to mark visited locations, “scratch off” covered regions and add notes and photos about their trips. The project includes the integration of SVG images using the Macaw library, the implementation of a scratch effect, and ensuring smooth user interaction. The result is an interactive tool that enhances travel experiences by providing a visual representation of visited places. The developed application contributes to digital travel tracking and improves user engagement through gamification elements.

*(Scientific Advisor: Yulia N. Kondratova, PhD in Physics and Mathematics, Associate Professor, Department of Mathematical Cybernetics and Computer Science, SSU)*

**Dmitrii P. Miliukov**

*Development of a Mobile Application for Organizing Travel*

The report discusses the development of a mobile application for Android designed for searching and purchasing airline tickets. The application provides users with a convenient interface for finding optimal offers, comparing prices, and proceeding to ticket booking through partner services. The report describes the main stages of development, the technologies used, and the principles of integration with ticket aggregator APIs. Special attention is given to the user-friendly interface and navigation, making the ticket search and booking process simple and accessible.

*(Scientific Advisor: Elena E. Lapsheva, Senior Lecturer, Department of Informatics and Programming, SSU)*

**Veronika D. Nikitina**

*LINQ queries on the .NET platform*

This study examines the application of Language Integrated Query (LINQ) in C# for querying SQL databases, XML, and JSON. LINQ offers a unified, type-safe syntax, enhancing code readability and reducing errors. The work evaluates LINQ's efficiency by comparing its performance across different data sources, including a speed analysis between LINQ and Parallel LINQ (PLINQ). The research includes a theoretical overview of LINQ’s core concepts, benefits, and limitations, followed by practical examples using LINQ to SQL, LINQ to XML, and LINQ to JSON. Performance tests compare execution speed, code conciseness, and usability between standard LINQ and PLINQ, as well as across different LINQ providers. Results demonstrate LINQ’s versatility in data processing and identify scenarios where PLINQ improves performance. The study provides insights into optimizing LINQ usage for efficient data querying.

*(Scientific Advisor: Marina S. Portenko, Senior Lecturer, Department of Informatics and Programming, SSU)*

**Darya A. Podkidysheva**

*Classification of Text Data*

The report discusses the development and application of text classification and clustering methods. It focuses on preprocessing techniques such as tokenization, stop-word removal, and lemmatization, along with feature extraction approaches like Bag-of-Words, TF-IDF, and Word2Vec. Various machine learning algorithms—including Support Vector Machines, Naive Bayes, Logistic Regression, and Random Forest—are implemented to analyze sentiment in a dataset of 2000 movie reviews. Additionally, clustering methods such as k-means and hierarchical clustering are explored to identify underlying patterns. Special attention is given to the evaluation of these methods, with Random Forest achieving the highest accuracy. The report highlights the practical significance of modern natural language processing techniques in automating text analysis and provides a foundation for further research in the field.

*(Scientific Advisor: Marina V. Ogneva, PhD in Physics and Mathematics, Head of the Department of Informatics and Programming, SSU)*

**Ivan S. Rodin**

*Development of a Machine Learning Model for Automated English Speaking Assessment*

This report presents the development of a machine learning model for automated English-speaking assessment. The model is designed to evaluate pronunciation, fluency, lexical diversity, and grammatical accuracy, providing an objective and efficient alternative to human assessment. The system utilizes speech recognition, natural language processing (NLP), and deep learning techniques to analyze spoken responses. The proposed approach aims to enhance the reliability and accessibility of language proficiency evaluation, particularly for standardized exams such as IELTS.

*(Scientific Advisor: Dmitry K. Andreychenko, Doctor in Physics and Mathematics, Head of the Department of Mathematical Support of Computer and Information Systems, SSU)*

**Alisa A. Nesterova, Veronika N. Rusakova**

*The Influence of Historical Factors on the Formation of Corporate Culture in Russian Companies: From Merchant Guilds to Modern Business Practices*

This report examines how historical factors have shaped the corporate culture of Russian companies. It outlines the evolution from early merchant guilds, which established foundational values of trust and community responsibility, to the Soviet era, where collectivism and centralized planning redefined organizational practices. The analysis continues with the transition period following the collapse of the Soviet Union, highlighting the infusion of Western management models into traditional Russian practices. Ultimately, the report discusses how modern Russian businesses combine hierarchical structures with personal relationships and global influences, offering insights into the unique corporate culture that drives today's economic landscape.

*(Scientific advisor: Tatyana B. Obert, Senior Lecturer, Department of Economic Theory and National Economy, SSU)*

**Artem O. Vidyaykin, Anastasiia V. Chernikova**

*Impact of key rate changes on the Russian economy*

The report analyzes the impact of the dynamics of the key rate of the Central Bank of the Russian Federation on the main macroeconomic indicators of the country. Both short-term and long-term consequences of this monetary policy instrument are considered, including the impact on inflation, investment, consumer demand, the ruble exchange rate, and economic growth rates. The authors study the effectiveness of using the key rate as an instrument for regulating the economy in the face of various external and internal shocks and also assess the directions and degree of the economy's response to rate changes in 2022-2025. The report presents statistical data confirming the conclusions and allowing us to assess the degree of influence of changes in the key rate on the economy of our country.

*(Scientific advisor: Tatyana B. Obert, Senior Lecturer, Department of Economic Theory and National Economy, SSU)*

**Panel Discussion 5: Computer Science, IT and Economics II (Building 12, Room 125)**

**April 9, Wednesday, 15:30-17:10**

**Time-limit: 7 minutes**

*Chairpersons:*

***Marina S. Portenko*** *(Senior Lecturer, Department of Informatics and Programming, SSU)*

***Svetlana V. Kuzmina*** *(PhD in Sociology, Associate Professor, Department of the English Language and Intercultural Communication, SSU)*

***Maria V. Ukolova*** *(Senior Lecturer, Department of the English Language and Intercultural Communication, SSU)*

**Elizaveta A. Chechetka**

*Development of Internal Software for the Interface Module of the Cathodic Protection Monitoring System*

The report is devoted to the description of the process of development of the internal software of the cathodic protection monitoring module. On the example of the module the stages of design, selection of hardware and software components are considered in detail. The importance of developing domestic solutions to ensure the stability and reliability of production processes is emphasized.

*(Scientific Advisor: Dmitry K. Andreichenko, Doctor of Sciences in Physics and Mathematics, Professor, Department of Mathematical Support of Computing Complexes and Information Systems, SSU)*

**Daniil M. Chindin**

*A Recommendation System for Optimizing Technological Processes in Mining Enterprises Based on Machine Learning Methods*

The report examines the solution to the problem of optimizing production using a software product based on machine and deep learning methods that implement the functionality of a recommendation system to help staff adjust the flow of the technical process toward improving the efficiency of the enterprise.

*(Scientific Advisor: Inna A. Batraeva, PhD in Physics and Mathematics, Head of the Department of Programming Technologies, SSU)*

**Maxim S. Firsov**

*Investigation of Existing Methods for Developing a Smart Traffic Light Simulator*

The report examines the challenges of urban transportation (traffic congestion, pollution) and the need for implementing "smart" traffic lights that adapt to vehicle flow. To test them, the use of Unity-based simulators is proposed, enabling the modeling of various traffic scenarios. Key challenges are noted: simulation realism, sensor integration, and algorithm development. The study aims to analyze existing research and select tools for simulator development.

*(Scientific Advisor: Anna S. Ivanova, PhD in Physics and Mathematics, Associate Professor, Department of Mathematical Cybernetics and Computer Science, SSU)*

**Anna V. Ganyushkina**

*Investigation of Fuzzy Search Algorithms for Automatic Error Recognition in the Text*

The report discusses and compares various methods of fuzzy search for typos in the text. For the analysis, various datasets with a small amount of data were used, as well as 2 datasets with a large amount of data as dictionaries. Various methods of fuzzy search have been applied, in particular methods based on edit distance. The metaphone phonetic algorithm and the N-gram method were also considered. The methods were analyzed for various categories of errors, their frequency and location. For the hybrid algorithm, algorithms were used that gave the best results, taking into account the specifics of errors.

*(Scientific Advisor: Marina V. Ogneva, PhD in Physics and Mathematics, Head of the Department of Informatics and Programming, SSU)*

**Artem N. Kalantarov**

*Intelligent MRI Image Analysis System*

This study presents the development of an intelligent system for analyzing MRI images, focusing on tumor segmentation and detection by employing advanced deep learning models such as U-Net and YOLO11x, alongside interpretability techniques like Grad-CAM.

*(Scientific Advisor: Pavel V. Kuptsov, Doctor of Physics and Mathematics, Professor, Department of Informatics and Programming, SSU)*

**Alena I. Konopleva**

*Study of the Influence of Neural Network Architecture on Object Recognition Quality in Noisy and Distorted Images*

This report examines the impact of neural network architecture on the quality of object recognition in noisy and distorted images, which can help improve training efficiency and the quality of obtained results.

*(Scientific Advisor: Marina V. Ogneva, PhD in Physics and Mathematics, Head of the Department of Informatics and Programming, SSU)*

**Ivan I. Korolev**

*Analysis and Prospects of Modern Software for Task Planning and Scheduling*

The report explores current software tools for task management and scheduling, highlighting their functionality, strengths, and limitations. The study examines various applications, ranging from individual task planners to enterprise-level scheduling systems, and discusses the integration of artificial intelligence to enhance efficiency. The paper concludes with a roadmap for developing a new tool, considering existing trends and user demands.

*(Scientific Advisor: Sergey V. Mironov, PhD in Physics and Mathematics, Dean of the Faculty of Computer Science and Information Technologies, SSU)*

**Roman A. Krylov**

*Building Social Networks and Analyzing Their Key Points and Clusters*

Networks are an integral part of human history, a fundamental principle on which all aspects of our lives have been built and continue to be built. They form not only social ties and public opinion, but also determine economic development, political stability, and even cultural diversity. Understanding the role of networks is the key to understanding how the world works. The report discusses methods for building and evaluating key nodes and clusters of social networks. The data has been taken from open sources. The analysis has been carried out according to three different laws: Sarnoff's Law, Metcalf's Law, and Reed's Law. The main points of centralization of the network and their interrelationships have been analyzed. The theory of seven handshakes has been tested.

*(Scientific Advisor: Irina D. Sagaeva, PhD in Physics and Mathematics, Associate Professor, Department of Discrete Mathematics and Informational Technologies, SSU)*

**Maksim A. Mazanov**

*Automated Generation of Interactive Levels for Rhythm Games Using Machine Learning*

Rhythm games are a popular type of video games that offers an engaging experience with their game contents, but creating high-quality charts (levels) remains a labor-intensive task requiring expertise in game design and music structure. This research explores methods for automating beatmap generation using machine learning techniques. Existing approaches, mainly including convolutional LSTM networks, are analyzed for their ability to extract audio features, predict audio timestamps, and generate human-like charts. The proposed methods reduce development time while maintaining synchronization with music, offering scalable solutions for content creation.

*(Scientific Advisor: Sergey V. Papshev, PhD in Physics and Mathematics, Associate Professor, Department of Mathematic Cybernetics and Computer Sciences, SSU)*

**Vadim V. Narvatov, Alexander D. Mezhonov, Anastasia M. Stolypina**

*Securities Issued on Tokens in Russia*

This project examines the technological content of cryptocurrency, analyzes and compares the global and Russian market for the use of tokens, and describes the drivers and barriers to the development of tokenization in Russia. Characteristic properties of a set of differences between a known crypto-unit and a token are highlighted. The thesis of "tokenization", "cryptocurrency" and "tokenomics" is described. A graph comparing BCAP and Bitcoin (BTC) based on software algorithms is formulated and calculated.

*(Scientific Advisor: Dmitry V. Melnichuck, PhD in Physics and Mathematics, Associate Professor, Department of Theory of Functions and Stochastic Analysis, SSU)*

**Maxim A. Rozhkov**

*Big Data Clustering Using HDBSCAN and UMAP*

The report addresses the issue of implementing machine learning algorithms for big data processing, mainly in psychiatry. The work has been carried out on EEG data of International 10‑20 system standard from clinical studies of patients with various mental disorders. The result of data clustering has been presented as a list of numeric values each one associated with a corresponding cluster. Visualization of data structures has also been carried out to provide an approximate understanding of which clusters can be formed. It has been assumed that various kinds of anomalies in brain activity can be detected after processing EEG data using machine learning methods. However, since a superficial clustering analysis has not shown precise results, the further objective is to determine the optimal values of clustering parameters and focus on processing the found outliers.

*(Scientific Advisor: Livat B. Tyapaev, PhD in Physics and Mathematics, Associate Professor, Department of Discrete Mathematics and Informational Technologies, SSU)*

**Vladimir V. Tkachev**

*Using Non-Trainable Randomly Initialized Layer in Neural Networks*

Neural networks can adapt to a number of tasks that previously had no means to be solved automatically. Although such networks are powerful, high resource requirements restrict their usability in constrained environments. The idea of a reservoir neural network addresses the problem by inventing the other way of building neural networks that employ immutable layers. The important neural network types, their architecture and theoretical foundations, including feed-forward and recurrent networks, are analyzed. The features and problems of traditional neural network predictors are mentioned. The idea of reservoir computing is discussed on the example of the Echo State Network.

*(Scientific Advisor: Pavel V. Kuptsov, Doctor of Physics and Mathematics, Professor, Department of Informatics and Programming, SSU)*

**POSTER SESSION 1: Physics and Natural Sciences (Building 12, Room 126)**

**08 April, Tuesday 12:30-14:30**

**Time-limit: 7 minutes**

***Daniil D. Drozd*** *(PhD in Chemistry, Associate Professor, Department of General and Inorganic Chemistry)*

***Tatyana R. Bogatenko*** *Lecturer Department of Radiophysics and Nonlinear Dynamics, SSU)*, *Lecturer Department of the English Language and Intercultural Communication, SSU)*

***Anna Yu. Smirnova (****PhD in Philology, Associate Professor, Department of the English Language and Intercultural Communication, SSU)*

**Inna V. Elizarova**

SLEEP-INDUCED PHOTOSTIMULATION OF LYMPHATIC CLEARANCE OF BETA-AMYLOID FROM THE BRAIN OF AGED MICE

This report describes the use of EEG-guided transcranial photobiomodulation (PBM) during sleep to stimulate lymphatic clearance of beta-amyloid (Aβ) from the brains of aged mice. The aim of the study was to optimize PBM parameters (wavelength, stimulation mode, dose) to activate meningeal lymphatic vessels (MLVs). Confocal imaging showed that 1050 nm pulsed LED stimulation with a dose of 30 J/cm² was most effective in enhancing lymphatic drainage of Aβ. The experiments showed that PBM during sleep significantly reduced Aβ levels in the brains of aged mice to levels characteristic of young mice, in contrast to PBM during wakefulness. This is hypothesized to be due to the activation of brain drainage during sleep and the restoration of MLV functions under the influence of PBM. The obtained results indicate the promise of PBM as a therapeutic approach to reduce Aβ accumulation and prevent neurodegenerative diseases.

Keywords: photobiomodulation, electroencephalography, meningeal lymphatic vessels, lymphatic drainage, neurodegenerative diseases.

*(Scientific Advisor: Oxana V. Semyachkina-Glushkovskaya, Head of Human and Animal Physiology Department, Doctor of Biological Sciences, SSU)*

**Maryam O. Zumaeva, Svetlana S. Ivashkina**

SOME SPECIAL FEATURES OF THE VEGETATION STRUCTURE NEAR VORONTSOVKA VILLAGE, SARATOV REGION

One thing we can do to protect steppe ecosystems is to study the vegetation (the plants) and its structure. We looked at plant communities two kilometers northeast of Vorontsovka village, in the Saratov region. The purpose was to understand how plant communities are arranged around Vorontsovka. We described and mapped the vegetation using a well-known method. The names of the plant groups are based on the main plants in each group.

*(Scientific Advisor: Mikhail*  *V. Stepanov, Associate Professor* *Department of Botany and Ecology, SSU)*

**Alina E. Pushkova**

INTER-SPECIES PROXIMITY IN AVIAN COLONIES: A ROUTE FOR THE SPREAD OF HIGHLY VIRULENT INFECTIONS

Avifauna plays an important role in the spread of infectious agents, threatening the health of humans and animals. The aim of the study was to assess the impact of cohabitation of various bird species on the natural foci of diseases. The ecological features of a colony of birds in the Saratov region in enzootic areas, including fish-eating and synanthropic species, were analyzed. The mechanisms of pathogen exchange and ways of transmission of infections to humans were considered. It was established that co-nesting creates conditions for the circulation of infectious agents. The results highlight the need to monitor bird colonies. The identified risks require the development of prevention and control strategies that take into account the ecology of the region and the human influence on the migration routes of birds. The data obtained is important for understanding the epidemiology and prevention of zoonotic outbreaks.

*(Scientific Advisor: Ekaterina Yu. Mosolova*, *PhD in Biology, Associate Professor, Department of Morphology and Ecology of Animals, SSU)*

**Darya A. Babenko**

FLORA OF THE 2ND GUSELKA RIVER (SARATOV REGION)

Currently, small rivers of the Saratov region are increasingly involved in the economic sphere of human activity. The aim of the study is to identify the ecological features of hydrophilic flora of the river 2-ya Guselka of Saratov, to assess its ecological state. The flora of the river 2-ya Guselka is represented by 34 species, 30 genera belonging to 23 families and two divisions Magnoliophyta (33 species) and Polypodiophyta (Salvinia natans (L.) All.). The main species diversity is in the estuary section of the river, where its flora is enriched with species from the Volgograd reservoir. 22 plant species were found in the estuary and 9 – in the riverbed. Assessment of the watercourse according to the structural parameters of macrophytes showed that the river is “moderately polluted”. The IBMR index was used to assess the trophic status, which showed “very high trophicity” of the river.

*(Scientific Advisor: Vladimir A. Boldyrev**Doctor in Biology; Head of Department;*

*Department of Botanics and Ecology, SSU)*

**Vera V. Balayeva**

INFLUENCE OF GEOMETRIC PARAMETERS OF NANOSCALE MAGNONIC CRYSTAL ON SPIN WAVE CHARACTERISTICS

The study of spin wave propagation features in a magnonic crystal based on a nanoscale ferromagnetic film with a periodic system of grooves on the surface was carried out using micromagnetic simulation software MuMax3. It was found that the signal propagates better in grooves than in ridges, which leads to the appearance of non-uniformity of magnetization distribution (fragmentation). The features of magnetization fragmentation are influenced by the signal's frequency and the ratio of the ridge and groove widths, as well as the period of the magnon crystal structure.

Additional modes are observed, which are formed as a result of the direct and reflected different width modes interaction. The ridge/groove ratio affects the energy distribution between the additional modes and the cutoff frequencies. As the waveguide’s width increases, the ridge/groove effect on dispersion characteristics weakens. The most pronounced band gaps in the dispersions and the widest band gaps in the frequency response are observed for large ridge/groove and a groove depth. Also, an increase in the ridge/groove leads to an increase in the number of orders of pronounced Bragg resonances.

*(Scientific Advisor: Maria A. Morozova, Doctor in Physics and Mathematics, Professor, Department of Nonlinear Physics, SSU)*

**Dmitry A. Vereshagin**

DENSELY PACKED COMPOSED SEMICONDUCTOR MATERIALS WITH HIGH DIFFUSE REFLECTIVITY

The report focuses on the study of light transfer properties in densely packed scattering systems using an effective medium model. The coated coherent potential approximation (CCPA) was applied to simulate radiation transport parameters, such as the scattering mean free path (SMFP) and transport mean free path (TMFP). The weak wavelength dependence of these parameters in the 300–1100 nm range explains the high reflectivity of the systems. The CCPA model accounts for structural characteristics (volume fraction of scatterers, their size) and optical properties of components, enabling the evaluation of scattering anisotropy’s contribution to transport properties. Experimental data confirm theoretical predictions: the diffuse reflectance coefficient reaches ~0.985, demonstrating spectral homogeneity. The results highlight the universality of the approach for analyzing high-packing-density systems, including optical parameter control via matrix modifications. The model offers prospects for designing tunable photonic materials, with potential applications in controlled diffusers and light management technologies.

*(Scientific Advisor: Dmitry A. Zimnyakov,**Doctor in Physics and Mathematics, Professor, Department of Medical Physics, SSU)*

**Ekaterina D. Illarionova**

NUMERICAL ANALYSIS OF THE MULTISTABILITY EXISTENCE POSSIBILITY NEAR THE BOUNDARY OF THE SYNCHRONIZATION MODE INDUCED BY NOISE

In the world of science, the phenomenon of synchronization attracts a lot of attention from scientists and has important theoretical and practical implications. The purpose of this work is to investigate the possibility of multistability near the synchronization boundary caused by noise in systems with continuous and discrete time. Ensembles of Lorentz oscillators and logistic maps are chosen as objects of research. The diagnosis of noise-induced synchronization was carried out by directly comparing the states of systems under the influence of a common noise source and calculating the synchronization error. To determine the presence of multistability near the boundary of this regime, a multistability measure was calculated. In addition, pools of attraction of synchronous and asynchronous modes are obtained at fixed points in time. The result of the work is a proof of the presence of multistability near the synchronization boundary induced by noise.

*(Scientific Advisor: Olga I. Moskalenko,* *Doctor in Physics and Mathematics, Professor of the Physics of Open Systems Department, SSU)*

**Yulia A. Gubanova**

MODELING OF ELECTROMAGNETIC OSCILLATIONS IN OPEN AXIALLY SYMMETRIC ECHELETTE RESONATORS USED TO IMPROVE MODE SELECTION IN THE TERAHERTZ AND THE SUBTERAHERTZ GYROTRONS

A numerical simulation method was developed for modeling electromagnetic oscillations in oversized gyrotron resonators with axial symmetry, including echelette-type resonators. A software code implementing this method was created. The use of such resonators will contribute to the creation of terahertz gyrotrons operating at higher harmonics of the cyclotron frequency and demonstrating low ohmic losses.

*(Scientific Advisor: Asel B. Adilova, Ph.D. in Physics and Mathematics; associate professor,*

*open systems physics department, SSU)*

**Andrey S. Ptashenko**

METALLIC SCREENS AND MAGNONIC CRYSTALS IN BILAYER YIG FILMS: CONTROL OF SPIN WAVE DAMPING AND NONRECIPROCITY

In this work, the influence of metal conductivity and the position of the metallic screen/magnonic crystal on the dispersion characteristics of spin waves in bilayer iron-yttrium garnet films has been investigated. Using finite element numerical modeling, dependencies of the forbidden zone widths on the conductivity of the metallic screen and its position relative to the ferromagnetic layers were obtained. A significant impact of the metallic screen's conductivity on the dispersion characteristics of spin waves was established. With decreasing conductivity, a gradual reduction in the interaction of spin waves with the metallic screen is observed, which manifests itself in changes to the shape of the dispersion branches and the shifting of forbidden zones. It was shown that at a certain threshold of metal conductivity, the nature of spin wave propagation becomes almost identical to that of a bilayer film without a metallic screen, except for the specific behavior of the dispersion branch reflecting the wave propagation near the metal boundary. Different effects of the metallic screen's position relative to the ferromagnetic layers on the dispersion characteristics of spin waves were identified. The obtained results are of great importance for further research in magnonics and spintronics.

*(Scientific Advisor: Aleksandr V. Sadovnikov, Ph.D. in Physics and Mathematics,* *Associate Professor, Department of Physics of Open Systems, SSU)*

**Pavel Strokin, Mger Arutyunyan**

MODIFICATION OF ALLOYED QUANTUM DOTS WITH THIOLS FOR APPLICATION IN BIOANALYSIS

The object of this study is the CdZnSeS/ZnS alloyed quantum dots (QDs) obtained by the method of one-step high-temperature organometallic synthesis. QDs obtained in this way are hydrophobic, which makes it impossible to use them in biological solution and necessitates their hydrophilization. Thiols were used as hydrophilizing agents. The dependences of the following properties of thiols-hydrophilized QDs on the applied modifier were studied: colloidal and optical stability, the photoluminescence quantum yield.

An increase in stability during long-term storage was noted with a decrease in the storage temperature of the modified samples. During hydrophilization by monothiols an increase in quantum yield was noted. The maximum increase was observed amounted to 51% relative to the original sample. This will allow the creation of sensors that are more sensitive to analytes and will give them an advantage in case of use in bioanalysis.

*(Scientific Advisor: Irina Yu. Goryacheva, Doctor of Chemistry; Professor, Head of the*

*Department of General and Inorganic Chemistry, SSU)*

**Anna Yu. Shabunina**

COMBINING OF UV SPECTROSCOPY WITH CHEMOMETRIC APPROACHES FOR DETERMINING OF CEPHALOSPORIN ANTIBIOTICS

The application of UV spectroscopy in combination with chemometric algorithms for determination of cephalosporin antibiotics is shown. The aim of the work is to use UV spectroscopic analysis with chemometric data processing algorithms for quantitative analysis of a binary mixture: ceftazidime-cefepime. The objects of the study were third-generation (ceftazidime) and fourth-generation (cefepime) cephalosporins. Spectral data were processed using Microsoft Excel with the Chemometrics2 add-in. In this work, the method of projection onto hidden structures was used to determine the concentrations of antibiotics in their mixture.

The work shows the possibility of combining UV spectroscopic and chemometric approaches for quantitative analysis of a binary mixture of antibiotics ceftazidime-cefepime. The range of detectable concentrations in the mixture is 6-20 mg/l, the determination coefficient and the slope of the “predicted-measured” dependencies are close to 1.

*(Scientific Advisor: Tatiana Yu. Rusanova, Doctor in Chemistry; Associate Professor; Head of the Department of analytical chemistry and chemical ecology, SSU)*

**Natalia P. Rybkina**

INVESTIGATION OF THE IFVD PROCESS PARAMETERS INFLUENCE ON PHOTOLUMINESCENCE WAVELENGTH SHIFT AND GAAS SURFACE QUALITY

This paper presents a study of the IFVD process parameters influence on the photoluminescence wavelength shift and GaAs surface quality. A study of the photoluminescence wavelength shift for an AlGaAs-based structure with a photoluminescence wavelength of 961 nm was also carried out. In the course of the study, the optimum regime of the thermal annealing process was found in which the generation of vacancies inside the structure under the silicon oxide layer occurs and the mixing of quantum wells under the strontium fluoride layer does not occur.  
*(Scientific Advisor: Anton A. Kozyrev, PhD of Technical Sciences Associate Professor, Department of solid body physics,**SSU)*

**Xenia M. Shipenok**

L-MENTHOL CRYSTALLIZATION IN AN AQUEOUS DISPERSION OF BIOLOGICALLY ACTIVE NANOPARTICLES OF CHITOSAN L- AND D-ASPARTATE

Phase separation in an ethanol solution of L-menthol in an aqueous dispersion of biologically active nanoparticles of chitosan L- and D-aspartate was studied. The process was found to proceed through the mechanism of selective extraction crystallization and to combine two types of phase separation (liquid–liquid and liquid–crystal). Liquid phase separation involves spontaneous dispersion of the ethanol macrophase to form an oil-in-water microemulsion and subsequent coalescence of the dispersed phase; and crystalline phase separation involves L-menthol crystallization into optically anisotropic fibrillar particles. The size of microdroplets and fibrils and their packing density in the condensed phase are significantly affected by the concentration of the components and surface tension of the aqueous macrophase and the enantiomeric form of chitosan aspartate. It has been suggested that the system under study is promising for the development of new approaches to studying the fundamental principles of phase separation during intracellular communication and regulation.

*(Scientific Advisor: Anna B. Shipovskaya* ***,*** *Doctor in Chemistry; Professor; Department of Polymers on the basis of AKRIPOL LLC, SSU)*

**Igor O. Filchenkov**

STUDY OF MECHANICAL PROPERTIES OF LIVING OBJECTS BY BRILLOUIN SPECTROSCOPY

In recent decades, biomechanics has made significant progress in understanding how mechanical forces influence cellular functions and tissue organization. Experimental evidence confirms the crucial role of cellular mechanical properties (stiffness, elasticity) in cell viability and adaptation. While traditional research focused on biochemical processes, modern studies demonstrate that mechanical characteristics are equally important for cellular behavior.

Brillouin light spectroscopy (BLS) has emerged as a novel method in mechanobiology, enabling non-contact, label-free analysis of viscoelastic properties of biological samples in 3D. This technique is based on light interaction with acoustic vibrations, providing high spatial resolution and the capability to create three-dimensional mechanical property maps. BLS is particularly valuable for studying living cells under conditions where traditional methods are unsuitable. This work explores potential applications of BLS in experimental research.

*(Scientific Advisor: Aleksandr V. Sadovnikov,Ph.D. in Physics and Mathematics, Associate Professor, Department of Physics of Open Systems)*

**Участники конференции:**

1. Адушкина Виктория Вячеславовна, аспирант биологического факультета 1-го года обучения СГУ им. Н.Г. Чернышевского
2. Бадалян Эрик Масисович, магистрант биологического факультета, 142 гр., СГУ им. Н.Г. Чернышевского
3. Видяпина Алена Сергеевна, студентка биологического факультета 421 гр., СГУ им. Н.Г. Чернышевского
4. Железнов Денис Ильич, аспирант Института химии 1-го года обучения СГУ им. Н.Г. Чернышевского
5. Кореньков Борис Денисович, аспирант Института химии 1-го года обучения СГУ им. Н.Г. Чернышевского
6. Кулисева Юлия Игоревна, аспирант биологического факультета 1-го года обучения СГУ им. Н.Г. Чернышевского
7. Семикова Виктория Алексеевна, студентка географического факультета 311 гр., СГУ им. Н.Г. Чернышевского
8. Соколова Елизавета Вадимовна, студентка биологического факультета 321 гр., СГУ им. Н.Г. Чернышевского
9. Тазаткина Ирина Михайловна, студентка биологического факультета 321 гр., СГУ им. Н.Г. Чернышевского
10. Такаишвили Валерия Вячеславовна, магистрант биологического факультета, 142 гр., СГУ им. Н.Г. Чернышевского
11. Тужилкин Матвей Алексеевич, магистрант биологического факультета, 143 гр., СГУ им. Н.Г. Чернышевского
12. Штырова Татьяна Сергеевна, магистрант биологического факультета, 142 гр., СГУ им. Н.Г. Чернышевского
13. Богоявленский Виталий Георгиевич, магистрант механико-математического факультета, 148 гр., СГУ им. Н.Г. Чернышевского
14. Волковойнова Лариса Дмитриевна, аспирант первого года обучения Института физики по направлению «Физическая электроника», СГУ им. Н.Г. Чернышевского
15. Воронин Фёдор Владимирович, магистрант механико-математического факультета, 148 гр., СГУ им. Н.Г. Чернышевского
16. Емельянова Елизавета Петровна, аспирант первого года обучения Института физики СГУ им. Н.Г. Чернышевского
17. Кашичкин Александр Олегович, аспирант первого года обучения Института физики СГУ им. Н.Г. Чернышевского
18. Лобанов Никита Дмитриевич, аспирант первого года обучения Института физики СГУ им. Н.Г. Чернышевского
19. Никишина Наталия Николаевна, аспирант первого года обучения Института физики СГУ им. Н.Г. Чернышевского
20. Павленко Олег Олегович, магистрант механико-математического факультета, 127 гр., СГУ им. Н.Г. Чернышевского
21. Приходько София Владиславовна, магистрант механико-математического факультета, 127 гр., СГУ им. Н.Г. Чернышевского
22. Ткачев Денис Владимирович,аспирант первого года обучения Института физики СГУ им. Н.Г. Чернышевского
23. Хмыров Артем Михайлович, аспирант биологического факультета 1-го года обучения, профиль «Биофизика», СГУ им. Н.Г. Чернышевского
24. Шаповал Роман Михайлович, аспирант Института физики 1-го года обучения, профиль «Биофизика», СГУ им. Н.Г. Чернышевского
25. Пантелеев Дмитрий Сергеевич, аспирант 1-го года обучения, факультета компьютерных наук и информационных технологий, СГУ им. Н.Г. Чернышевского
26. Лукьянов Павел Сергеевич, магистрант механико-математического факультета, 127 гр., СГУ им. Н.Г. Чернышевского
27. Тихонова Анна Александровна, студентка 351 группы механико-математического факультета
28. Аймаганбетова Анара Муханбеткалиевна, аспирант 2 года обучения факультета психолого-педагогического и специального образования, СГУ им. Н.Г. Чернышевского
29. Айтимов Дамир Аксерикович, соискатель факультета психолого-педагогического и специального образования, СГУ им. Н.Г. Чернышевского
30. Вильцев Данила Денисович, магистрант факультета компьютерных наук и информационных технологий, 173 гр., СГУ им. Н.Г. Чернышевского
31. Григорьева Анастасия Игоревна, магистрант 1 курса, 150 гр., факультет физико-математических и естественно-научных дисциплин, СГУ им. Н.Г. Чернышевского
32. Козлова Ирина Сергеевна, соискатель факультета психолого-педагогического и специального образования, СГУ им. Н.Г. Чернышевского
33. Малюкин Данил Алексеевич, магистрант 1 курса, 120 гр., факультет физико-математических и естественно-научных дисциплин, СГУ им. Н.Г. Чернышевского
34. Передреев Никита Дмитриевич, магистрант 1 курса, 120 гр., факультет физико-математических и естественно-научных дисциплин, СГУ им. Н.Г. Чернышевского
35. Попадюк Елизавета Алексеевна, магистрант факультета, 135 гр., физико-математических и естественно-научных дисциплин, СГУ им. Н.Г. Чернышевского
36. Полидорский Леонид Владимирович, магистрант 1 курса, 150 гр., факультет физико-математических и естественно-научных дисциплин, СГУ им. Н.Г. Чернышевского
37. Самсонова Алина Александровна, студентка механико-математического факультета, 351 гр., СГУ им. Н.Г. Чернышевского
38. Cахипов Артём Олегович, студент 3 курса, 351 гр., факультет физико-математических и естественно-научных дисциплин, СГУ им. Н.Г. Чернышевского
39. Акишина Полина Дмитриевна, студентка факультета компьютерных наук и информационных технологий, 341 гр., СГУ им. Н.Г. Чернышевского
40. Ганюшкина Анна Вячеславовна, магистрант факультета компьютерных наук и информационных технологий, 173 гр., СГУ им. Н.Г. Чернышевского
41. Калантаров Артем Наилевич, магистрант факультета компьютерных наук и информационных технологий, 173 гр., СГУ им. Н.Г. Чернышевского
42. Королев Иван Иванович, магистрант факультета компьютерных наук и информационных технологий, 173 гр., СГУ им. Н.Г. Чернышевского
43. Коноплева Алена Игоревна, магистрант факультета компьютерных наук и информационных технологий, 173 гр., СГУ им. Н.Г. Чернышевского
44. Крылов Роман Алексеевич, магистрант факультета компьютерных наук и информационных технологий, 171 гр., СГУ им. Н.Г. Чернышевского
45. Кудашева Милана Микаиловна, студентка факультета компьютерных наук и информационных технологий, 351 гр., СГУ им. Н.Г. Чернышевског
46. Мазанов Максим Александрович, магистрант факультета компьютерных наук и информационных технологий, 173 гр., СГУ им. Н.Г. Чернышевского
47. Милюков Дмитрий Павлович, студент факультета компьютерных наук и информационных технологий, 341 гр., СГУ им. Н.Г. Чернышевского
48. Нарватов Вадим Валерьевич, магистрант механико-математического факультета, 148 гр., СГУ им. Н.Г. Чернышевского
49. Межонов Александр Дмитриевич,магистрант механико-математического факультета, 148 гр., СГУ им. Н.Г. Чернышевского
50. Столыпина Анастасия Михайловна, магистрант механико-математического факультета, 148 гр., СГУ им. Н.Г. Чернышевского
51. Никитина Вероника Дмитриевна, студентка факультета компьютерных наук и информационных технологий, 341 гр., СГУ им. Н.Г. Чернышевского
52. Подкидышева Дарья Александровна, студентка факультета компьютерных наук и информационных технологий, 341 гр., СГУ им. Н.Г. Чернышевского
53. Родин Иван Сергеевич, студент факультета компьютерных наук и информационных технологий, 441 гр., СГУ им. Н.Г. Чернышевского
54. Рожков Максим Александрович, магистрант факультета компьютерных наук и информационных технологий, 171 гр., СГУ им. Н.Г. Чернышевского
55. Ткачев Владимир Владимирович, магистрант факультета компьютерных наук и информационных технологий, 173 гр., СГУ им. Н.Г. Чернышевского
56. Фирсов Максим Сергеевич, магистрант факультета компьютерных наук и информационных технологий, 173 гр., СГУ им. Н.Г. Чернышевского
57. Чечетка Елизавета Антоновна, магистрант факультета компьютерных наук и информационных технологий, 173 гр., СГУ им. Н.Г. Чернышевского
58. Чиндин Даниил Михайлович, магистрант факультета компьютерных наук и информационных технологий, 173 гр., СГУ им. Н.Г. Чернышевского
59. Видяйкин Артём Олегович, студент экономического факультета, 411 гр., СГУ им. Н.Г. Чернышевского
60. Нестерова Алиса Александровна, студентка экономического факультета, 412 гр., СГУ им. Н.Г. Чернышевского
61. Русакова Вероника Николаевна, студентка философского факультета, 431 гр., СГУ им. Н.Г. Чернышевского
62. Черникова Анастасия Васильевна, студентка экономического факультета, 412 гр., СГУ им. Н.Г. Чернышевского

**Участники конференции c постерными (стендовыми докладами):**

1. Елизарова Инна Владимировна, магистрант биологического факультета, 143 гр., СГУ им. Н.Г. Чернышевского
2. Зумаева Марям Османовна, магистрант биологического факультета, 142 гр., СГУ им. Н.Г. Чернышевского
3. Ивашкина Светлана Сергеевна, магистрант биологического факультета, 142 гр., СГУ им. Н.Г. Чернышевского
4. Пушкова Алина Евгеньевна, аспирант 1 года обучения, специальность 1.5 Биологические науки, СГУ им. Н.Г. Чернышевского
5. Бабенко Дарья Алексеевна, аспирант биологического факультета 1 года обучения, СГУ им. Н.Г. Чернышевского
6. Балаева Вера Вячеславовна, аспирант Института физики 1-го года обучения, СГУ им. Н.Г. Чернышевского
7. Верещагин Дмитрий Александрович, аспирант Института физики 1-го года обучения, СГУ им. Н.Г. Чернышевского
8. Илларионова Екатерина Дмитриевна, аспирант Института физики 1-го года обучения, СГУ им. Н.Г. Чернышевского
9. Губанова Юлия Андреевна, аспирант Института физики 1-го года обучения, СГУ им. Н.Г. Чернышевского
10. Пташенко Андрей Сергеевич, аспирант Института физики 1-го года обучения, СГУ им. Н.Г. Чернышевского
11. Строкин Павел Дмитриевич, аспирант Института физики 1-го года обучения, СГУ им. Н.Г. Чернышевского
12. Арутюнян Мгер Араикович, студент Института химии, 311 гр., СГУ им. Н.Г. Чернышевского
13. Шабунина Анна Юрьевна, аспирант Института физики 1-го года обучения, СГУ им. Н.Г. Чернышевского
14. Рыбкина Наталья Павловна, аспирант Института физики 1-го года обучения, СГУ им. Н.Г. Чернышевского
15. Шипенок Ксения Михайловна, аспирант Института физики 1-го года обучения, СГУ им. Н.Г. Чернышевского
16. Фильченков Игорь Олегович, аспирант Института физики 1-го года обучения, СГУ им. Н.Г. Чернышевского