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School of Medicine

News

ACTOVEGIN IN THE MANAGEMENT OF PATIENTS AFTER ISCHEMIC STROKE

Recent epidemiologic data suggest that the highest incidence of stroke is in East Asia, followed by Eastern Europe and Central Asia. Data from the Global Burden of Ischemic and Hemorrhagic Stroke study indicate the highest age-standardized mortality rate from ischemic stroke in the world is in Kazakhstan (149-174 deaths per 100,000 person years). Actovegin is a hemodialysate of calf's blood and has been used for several decades in the countries of Central Asia, East Asia, Russia and some European countries. It has been used to treat patients with various neurological conditions, vascular disorders, and ischemic stroke. We performed a systematic review to evaluate the effect of Actovegin in patients who have suffered an acute stroke. This included 4 observational studies with control groups and one randomized, placebo-controlled clinical trial. These studies enrolled a total of 3879 patients of which 720 patients received Actovegin administered intravenously and/or orally for a duration ranging from 10 to 180 days. No consistent evidence on improved survival, quality of life, neurologic symptoms, activities of daily living or disability was identified. One study showed statistically significant improvements in the Alzheimer's Disease Assessment Scale, cognitive subscale, (extended version) for Actovegin compared with placebo at 6 months but the clinical relevance of this change is uncertain. One study reported a higher incidence of recurrent ischemic stroke, transient ischemic attack or intracerebral hemorrhage in patients taking Actovegin compared to placebo.



Philip la Fleur, Assistant Professor of Practice, Director of Center for Clinical Trials, NUSOM/UMC

Products such as Viferon (interferon suppositories), Hylak Forte (Lactobacilli), and Ceraxon (citicoline) have been commonly used in countries of the former Soviet Union. These products have been recommended in the Kazakhstan clinical practice guidelines for various diseases. In contrast, their lack of mention in major guidelines from the USA, Europe and the United Kingdom is an observation deserving of study. Pharmacy shelves in Central Asia contain some products that would be unfamiliar to clinicians practicing medicine in other parts of the globe. Other products in Kazakhstan are promoted as 'neuroprotectors' or 'hepatoprotectors', can be purchased without a prescription and are purported to have a wide range of health benefits. Clear evaluation of treatment benefits and harms has not been performed in randomized clinical trials for

many of these products, despite apparent widespread usage. Actovegin is one such product and has seen significant use in Central Asia in recent years. However, recent sales data suggest that Actovegin use has declined, perhaps related to the lack of a clear understanding of benefit:risk in this context.

Currently available data demonstrate that the benefits are uncertain for Actovegin and that there is potential risk of harm in patients with stroke. More evidence is needed from rigorously designed clinical trials to justify the role of Actovegin in patients with ischemic stroke. This was recently published in the journal PLoS One (Q1, IF 3.75) *la Fleur P, Baizhaxynova A, Reynen E, Kaunelis D, Galiyeva D. Actovegin in the management of patients after ischemic stroke: A systematic review. PLoS One. 2022 Jun 30;17(6):e0270497*

RECENT OUTPUTS FROM DMITRIY VIDERMAN, HIS TEAM AND COLLABORATIONS



Dmitriy Viderman, MD,
Assistant Professor NUSOM

Post-operative Osteomyelitis in developing countries - A case-control study Gulnur Slyamova, a graduate of the MPH program under the guidance of Dr. Viderman published the results of her study «Risk factors for postoperative osteomyelitis among patients after bone fracture: a matched case-control study» in the Journal of clinical medicine (Q1, IF 4.96). This is the first casecontrol study in Central Asian region, which investigates the epidemiology of postoperative osteomyelitis in developing countries. The study found the determinants of acute and chronic osteomyelitis in patients after fracture, who underwent orthopedic surgeries. Six independent risk factors were identified, including fracture type, complications of initial fracture, history of diabetes or blood glucose >7 g/L, incision/ wound length more than 10 cm, number of implanted medical items, and occupation status. Of them, incision length and number of implanted medical items are true modifiable factors. Better preoperative risk assessment can identify a group of patients, which require additional prophylactic measures. *Risk factors for postoperative osteomyelitis: a matched case-control study». Gulnur Slyamova, Arnur Gusmanov, Arman Batpenov, Nurlan Kaliev and Dmitriy Viderman. J. Clin. Med. 2022, 11.*

A recent systematic review and Meta-Analysis - «**Ultrasound-Guided Erector Spinae Plane Block in Thoracolumbar Spinal Surgery**» was recently accepted in Frontiers in Medicine (Q1, IF 5.1). This meta-analysis found that ultrasound-guided erector spinae plane block was superior to placebo in reducing post-operative opioid consumption, pain intensity, post-operative nausea and vomiting, and prolonging the time to first rescue analgesia. *Ultrasound-Guided Erector Spinae Plane Block in Thoracolumbar Spinal Surgery: A Systematic Review and Meta-Analysis. Viderman D, Aubakirova M, Umbetzhanov Y, Kulkaeva G, Shalekenov SB, Abdildin YG. Front Med (Lausanne). 2022 Jul 4;9:932101. doi: 10.3389/fmed.2022.932101.*

Cerebral Ischemia in subarachnoid haemorrhage - A map of mechanisms of subarachnoid hemorrhage-induced cerebral vasospasm and delayed cerebral ischemia was created. The pathophysiology of cerebral vasospasm and delayed cerebral ischemia include a reduction in NO production, direct activation of calcium channels, triggering oxidative stress and free radical damage to smooth muscle and lipid peroxidation of cell membranes, cortical spreading depolarizations, sympathetic activation, upregulating genes involved with inflammation and extracellular matrix remodelling, finally resulting in the failure of cerebral autoregulation, microthrombosis and cerebral ischaemic injury. This cascade of events might explain why medical therapy often fails to reverse resistant cerebral vasospasm and to prevent cerebral ischaemia. *Mechanisms of cerebral vasospasm and cerebral ischaemia in subarachnoid haemorrhage. Viderman D, Tapinova K, Abdildin YG. Clin Physiol Funct Imaging. 2022 Sep 9. doi: 10.1111/cpf.12787. (Q2, IF 2.27)*

Intravenous versus Epidural Routes of Patient-Controlled Analgesia - A recent meta-analysis found that patient-controlled intravenous analgesia compared with patient-controlled epidural analgesia was associated with fewer episodes of hypotension. PCEA was associated with a shorter length of hospital stay. Pain control and other side effects did not differ significantly.

It was published in the J. Clin Med (Q1, IF 4.96) «*Intravenous versus Epidural Routes of Patient-Controlled Analgesia in Abdominal Surgery: Systematic Review with Meta-Analysis*. Viderman D, Tapinova K, Nabidollayeva F, Tankacheev R, Abdildin YG. J Clin Med. 2022 May 5;11(9):2579. doi: 10.3390/jcm11092579.

AI solutions might be useful in anatomical landmark identification, reducing or even avoiding possible complications (such as injury to the anatomical structures and local anesthetic systemic toxicity). AI-guided solutions can improve the optimization and interpretation of the sonographic image, visualization of needle advancement, and injection of local anesthetic. This study was recently published: *Artificial intelligence in ultrasound-guided regional anesthesia: a scoping review*, Dmitriy Viderman*, Mukhit Dossov, Serik Seitenov and Min-Ho Lee. "Frontiers in Medicine - Intensive Care Medicine and Anesthesiology". <https://doi.org/10.3389/fmed.2022.932101> (Q1, IF 5.1)

RESEARCH ON BRAIN-DERIVED NEUROTROPHIC FACTOR AND CORTICOTROPIN RELEASING HORMONE IN VITILIGO PATIENTS



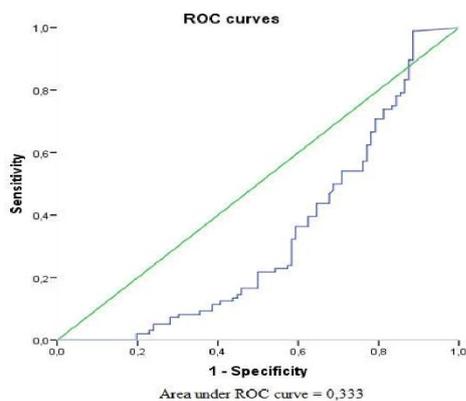
Prof. Y. Semenova NUSOM

Vitiligo is a common autoimmune disease, which manifests as the visible whitish patches on skin and mucosal membranes. The origin of vitiligo is unknown and the global prevalence varies from 0.5% to 2%. It is believed that vitiligo pathogenesis is associated with the intrinsic abnormalities of melanocytes, oxidative stress, and sympathetic neurogenic imbalances. Therefore, investigation of some crucial signaling substances might enable better understanding of the role played by neuroendocrine disturbances in vitiligo pathogenesis. In this regard, our research team investigated serum levels of brain-derived neurotrophic factor (BDNF) and corticotropin releasing hormone (CRH) as well as their single nucleotide polymorphisms (SNPs) in vitiligo patients and healthy controls in relation to the symptoms of generalized anxiety disorder.

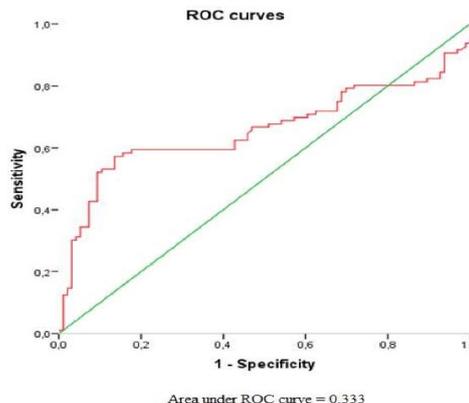
The serum levels of BDNF were significantly lower in vitiligo patients than in healthy individuals, while the serum levels of CRH were markedly higher in vitiligo patients than those in controls. In general, there was a significant increase of anxiety levels in vitiligo patients as compared with the healthy controls. Also, we identified a significant positive correlation between serum CRH level and anxiety grade. However, there was no correlation between levels of anxiety and serum BDNF level. After analyzing the SNPs of the two groups, we were able to establish a significant relationship between the CRH-R1 rs242924 and BDNF rs11030094 polymorphisms and vitiligo. Moreover, the serum levels of neurotransmitters were associated with the CRH-R1 rs242924 and BDNF rs11030094 SNPs.

This study makes a significant contribution to the limited evidence of relationship between BDNF, CRH, vitiligo, and anxiety. The genetic variations of interest may play a role in the development of vitiligo. There is a need to carry-out large-scale studies to investigate the screening values of CRH and BDNF in real clinical practice. The study results were published in two internationally recognized peer-review journals:

1. Kussainova, A., Kassym, L., Akhmetova, A., Dvoryankova, E., Glushkova, N., Khismetova, Z., Adilgozhina, S., Tuleutayeva, R., Kaskabayeva, A., Massabayeva, M., Pak, L., & Semenova, Y. (2022). Associations between serum levels of brain-derived neurotrophic factor, corticotropin releasing hormone and mental distress in vitiligo patients. *Scientific reports*, 12(1), 7260. <https://doi.org/10.1038/s41598-022-11028-8> (Q1, IF 5.0).
2. Kussainova, A., Kassym, L., Bekenova, N., Akhmetova, A., Glushkova, N., Kussainov, A., Urazalina, Z., Yurkovskaya, O., Smail, Y., Pak, L., & Semenova, Y. (2022). Gene polymorphisms and serum levels of BDNF and CRH in vitiligo patients. *PloS one*, 17(7), e0271719. <https://doi.org/10.1371/journal.pone.0271719> (Q1, IF 3.75).



Receiver operating curve graph to evaluate the diagnostic performance of serum BDNF for forecasting of vitiligo event



Receiver operating curve graph to evaluate the diagnostic performance of serum CRH for forecasting of vitiligo event

ENDOMETRIOSIS IS A COMPLEX GYNECOLOGICAL DISORDER

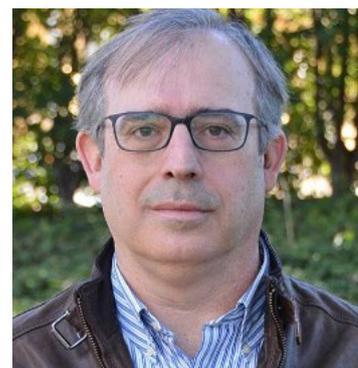


Prof. Milan Terzic NUSOM

“Endometriosis is a complex gynecologic disorder” comments Milan Terzic, Professor of Gynecology at Nazarbayev University School of Medicine and at the National Research Center of Mother and Child Health, University Medical Center has been studying this disease for a long time. “Diagnosis, markers, and therapeutic treatments remain unclear and somehow enigmatic and there is not yet a single theory about its pathology and causes”. A problem that has concerned Prof. Terzic in his extensive clinical practice, is that women with endometriosis appear to be more likely to develop certain types of cancer, particularly ovarian cancer. “Both endometriosis and ovarian cancer are multifactorial diseases with unclear etiology, so it is not surprising that more questions than answers remain regarding the

possible relationship between both diseases” indicates Zaukiya Khamitova, a 2022 NUSOM Master in Public Health graduate, whose master thesis was a study investigating the possible association between both problems, supervised by Prof. Antonio Sarria-Santamera and Dr. Gusmanov, also from the Department of Medicine at NUSOM, and specialists in the use of data collected in electronic medical records to conduct epidemiological studies.

The results of Zaukiya’s thesis have been recently published. In this work, a “case-control” study based on the analysis of data of more than 608,980 women, 4,505 of them presented with ovarian cancer. Those findings suggest that having a history of endometriosis increases the risk of ovarian cancer almost three times (2.66). “A retrospective study based on data already collected has some limitations, but our work does, however, have certain noteworthy strengths”, as commented by Prof. Sarria-Santamera. The most essential aspect of the study is its large sample size, as well the

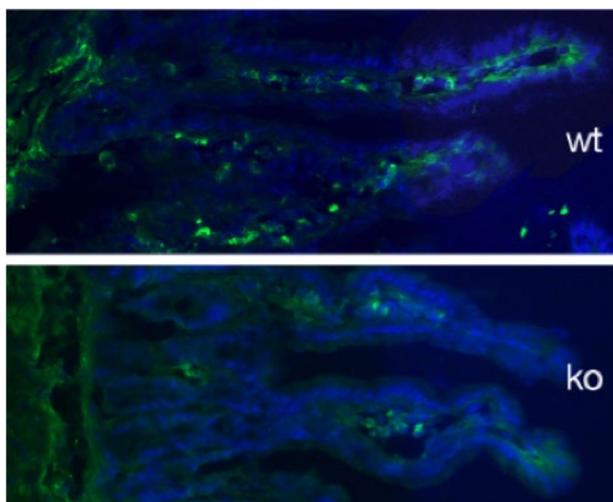


Prof. A. Sarria-Santamera
NUSOM

“The linkage” of both data from hospital discharges and from ambulatory care. “The unique methodology of this study provided us with a more complete and comprehensive understanding of this problem”. What are the implications? Prof. Terzic and Prof. Sarria-Santamera indicate that doctors treating women with endometriosis should pay close attention to changes or worsening of symptoms. Future research should attempt to answer if the higher risk of ovarian cancer affects all women with endometriosis or only some of them. “Our challenge is to understand enough about the etiological, including genetic, relationships between endometriosis and ovarian cancer so that we can reduce the morbidity and mortality associated with this disease”

The manuscript entitled “History of endometriosis is independently associated with an increased risk of ovarian cancer” by Antonio Sarria-Santamera and his research team (Z.Khamitova, A.Gusmanov, M.Terzic, M.Polo-Santos, M.A.Ortega, A.Asúnsolo) has been published in *Journal of Personalized Medicine* <https://pubmed.ncbi.nlm.nih.gov/36013285> (Q2 IF 3.5)

ROLE OF PERIOSTIN IN INFLAMMATORY BOWEL DISEASE DEVELOPMENT AND SYNERGISTIC EFFECTS MEDIATED BY THE CCL5-CCR5 AXIS



Absence of periostin reduces the number of CCR5-expressing cells in the intestine of healthy mice. Representative captures of wild type (wt) (A) and periostin deficient (ko) (B) small intestine sections showing an immunofluorescence staining using CCR5 antibody (green) and DAPI (blue).

We and others have independently shown that the expression pattern of the matricellular protein periostin is changed during Inflammatory Bowel Disease (IBD) in mice and men. Periostin has been identified as one of the drivers in several inflammatory diseases including IBD. Interestingly the C-C chemokine receptor 5 (CCR5) is engaged by the chemotactic mediators CCL3/MIP-1 α , CCL4/MIP-1 β and CCL5/RANTES. CCR5 blockade has been reported to ameliorate inflammation in a murine IBD model. Thus periostin and CCR5 both are involved in the development, progression and perpetuation of IBD. In this study, we investigated a potential cross-talk between the two signaling systems in a murine model of IBD and in periostin deficient mice, that we had generated in our lab. We observed that absence of periostin has an influence on the CCR5- expressing cell

population of the gut (see figure). Furthermore, we tested a highly potent CCL5 derivative acting as CCR5-antagonist developed by Dr. Vangelista's lab using a murine model of IBD. Interestingly, the pool of infiltrating CCR5 expressing lymphocytes was very effectively reduced by the novel antagonist. This report is the first one demonstrating a linkage between periostin signaling and the CCL5-CCR5 axis. Our data further support the notion that targeted modulation of the periostin and CCR5 signaling systems bears therapeutic potential for IBD. The study was just accepted in *Frontiers in Immunology* (Q1 IF 8.8), «*Role of periostin in inflammatory bowel disease development and synergistic effects mediated by the CCL5-CCR5 axis*» authored by Saida Mukanova, Anton Borissenko, Alexey Kim, Aigerim Bolatbek, Ainur Abdrakhmanova, Luca Vangelista, Eva Riethmacher and Dieter Riethmacher. *Front. Immunol. - Nutritional Immunology*, DOI: 10.3389/fimmu. 2022.956691

COMMUNICATED BY DR. EVA RIETHMACHER, DR. VANGELISTA AND DR. DIETER RIETHMACHER

TRANSPLANTATION IN CENTRAL ASIA - A CONFERENCE ORGANIZED BY UMC

The Conference “Transplantation in Central Asia: Innovation, Cooperation, Compassion” was held on September 22-23, 2022 and marked the 10th anniversary since the first heart transplant and the pediatric kidney transplantation in Kazakhstan. The purpose of the Conference was to bring together doctors and nurses of different profiles, organ procurement and transplant coordinators to discuss advancements in medical science, developments in patient care and topics pertinent to pre and post-operative treatment.



The Opening Ceremony was addressed by Mrs. Akmaral Alnazarova, Member of the Senate of the Parliament of the Republic of Kazakhstan. Next the President of the Nazarbayev University, Mr. Shigeo Katsu, delivered an opening speech that was followed by the official opening by the CEO of the University Medical Center Dr. Yuriy Pya.

The Conference covered many different aspects including sessions on Best practices from different angles, where special guests from different organizations

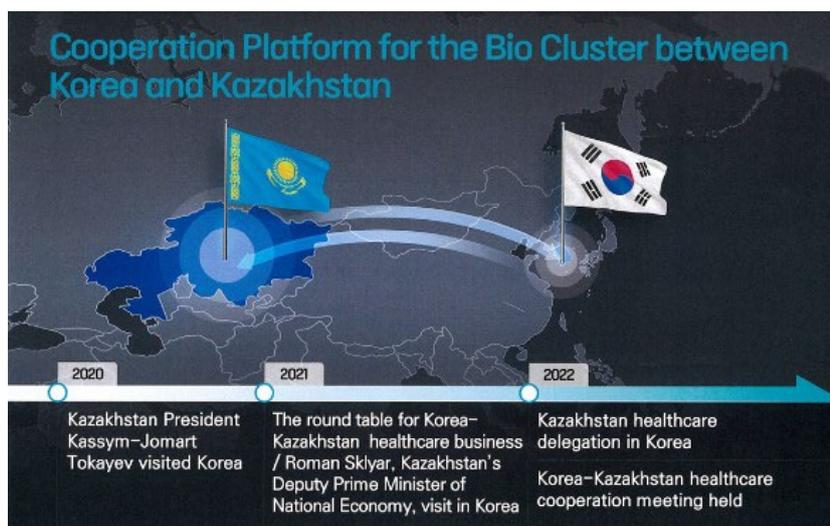
(Swisstransplant, Canadian Donation and Transplantation Research Program, DTI Foundation, Transplant Québec, Eurotransplant) shared their experience in organization organ and tissue transplantation; a special section on organizational issues in organ and tissue transplantation programs; a Symposium on left ventricular assist device «LVAD as a bridge to life»; and eight clinical Sections (Pulmonary Hypertension and Lung Transplantation section, Heart transplantation section, Nursing section, Oncohematology section, Liver transplantation section, Pediatric Cardiology section, Kidney Transplantation section, Arrhythmology section). A total of 75 reports were presented at the Conference: 23 of them were delivered by foreign speakers (10 video lectures) and 52 by local specialists. 521 participants attended the Conference and more than 900 views were registered during live broadcasts.

SHARED BY THE CARDIAC SURGERY RESEARCH DEPARTMENT

UPDATE ON THE CREATION OF BIOMEDICAL CLUSTERS IN THE REPUBLIC OF KAZAKHSTAN - A COOPERATION PLATFORM BETWEEN SOUTH KOREA AND KAZAKHSTAN

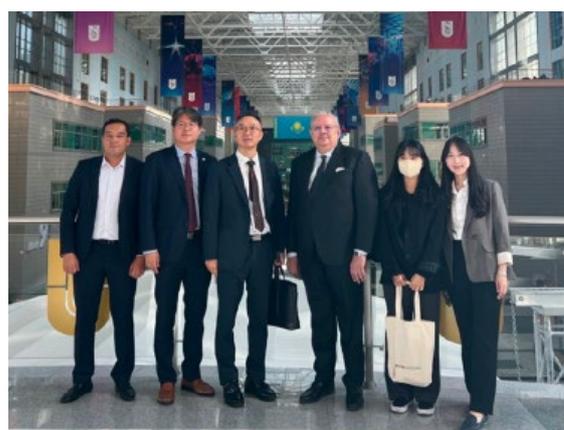
Following the recent Head of State instructions that “the share of locally produced medicines and medical devices must be increased from the existing 17% to 50% as early as 2025”, a number of Biomedical Clusters will be established in the Republic of Kazakhstan to increase the competitiveness of the local pharmaceutical and medical industries, and of the domestic production of drugs and medical devices. The clusters would comprise of universities, research centers, companies, manufacturing facilities, academic medical centers and university hospitals and clinics. Nazarbayev University School of Medicine has been working with the Ministry of Health, SK Pharmacy to support the creation of the Biomedical Cluster in Astana. In South Korea, Biomedical Clusters were established to foster synergy and cooperation between academic institutions and the

healthcare industry and they have successfully created a vibrant environment attracting national and international investors with the development of innovative technologies for diagnostics, drug therapeutics and medical interventions.



On September 22, 2022, Nazarbayev University School of Medicine hosted a delegation of the Korean Health Industry Development Institute (KHIDI), a strategic partner of the Ministry of Health of the Republic of Kazakhstan in the biomedical cluster project. KHIDI is a government agency under the Ministry of Health of the Republic of Korea. It is a professional institute dedicated to the global advancement of the Korean Health Industry.

During the visit Vice-President for Medicine, Massimo Pignatelli, Dieter Riethmacher, Vice-Dean for Research and Graduate Studies, Alibek Abdhullayev, General Manager for Innovation and Commercialization, NU Medicine together with faculty and staff involved in the development of the Biomedical Cluster in Astana, discussed the clinical and biomedical research infrastructure in the School, University Medical Center (UMC) and on the main Campus (Technopark, C4, Center for Life Sciences). During the visit, two new projects that will support the Biomedical Cluster in Astana were also presented; the construction of the Vivarium, a state-of-art facility for animal experimentation (to be completed by December 2023) and the new Roche Diagnostic Training Center in the Medical School building (to be officially opened in November 2022). During the meeting, Dr Dieter Riethmacher also presented the training capability of the School of Medicine in drug design, drug development, pharmacology, toxicology, molecular medicine. Together with the state-of-the-art laboratory infrastructure, the School will also support the selection, recruitment and retention of talents for the Biomedical Cluster.



The pictures show the KHIDI delegation in front of Nazarbayev University School of Medicine and in the atrium at NU, with some members of the cluster team, Dr. Pignatelli, *Vice President for Medicine and Dean*, Dr. Salustri, *Departmental Chair Medicine*, Dr. Riethmacher, *Vice Dean for Research and Graduate Studies*, Dr. Aljofan, *Associate Prof. NUSOM* and Alibek Abdullayev, *General Manager for Innovation and Commercialization, NU Medicine*.

COMMUNICATED BY DR. MASSIMO PIGNATELLI AND DR. DIETER RIETHMACHER



School of Sciences and Humanities News

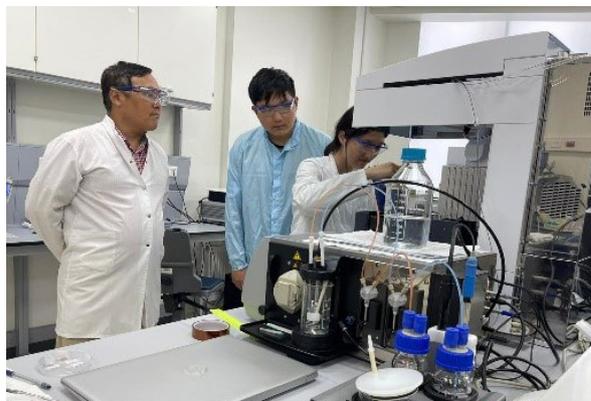
SUMMER RESEARCH AT CHEMISTRY LAB

SHARED BY PROF. SALINGEREY ADILOV

Recently, Prof. Salimgerey Adilov from the Department of Chemistry, School of Science and Humanities of Nazarbayev University hosted two high school students from the USA for summer research in his lab and supervised their research. The two high school students are the US-born ethnic Kazakhs from Edward R. Murrow High School and Brooklyn Technical High School respectively located in Brooklyn, New York City.

Prof. Adilov assigned Marat Nueraji, an upcoming senior high school student, to research the development of multifunctional nanocomposites and assigned Aygul Nueraji, an upcoming junior high school student, to do research in conducting polymers. The two high school students are visiting Kazakhstan for the first time. They are actively involved in research and easily get along with their research team members. They expressed their gratitude to Prof. Adilov for providing them with the research opportunity and are impressed with the research facilities and the beautiful campus at Nazarbayev University. Marat's research results will be presented in ACS Fall 2022 in Chicago, IL, USA.

The two students established Kazakh Children Support Group (KCSG) which is a charity foundation aiming to aid and support Kazakh children in poor economic conditions. In collaboration with CDF of Nazarbayev University, Marat and Aygul taught kids English via zoom for one semester starting from the middle of January 2022 until June 2022. On this trip, both students also visited NU's Children Development Foundation (CDF) and had lunch with the former and current president of CDF NU. They want to continue the collaboration with CDF next semester according to their introduction. They expressed their interest in visiting NU next year if there is an opportunity.



Marat and Aygul with Prof. Salimgerey Adilov



Marat and Aygul with Current and Former Presidents, Dilyara and Narkez, of CDF NU

NU PHYSICISTS DEVELOPED PEROVSKITE SOLAR CELLS WITH A NOVEL DEVICE ARCHITECTURE ON RIGID AND FLEXIBLE SUBSTRATES

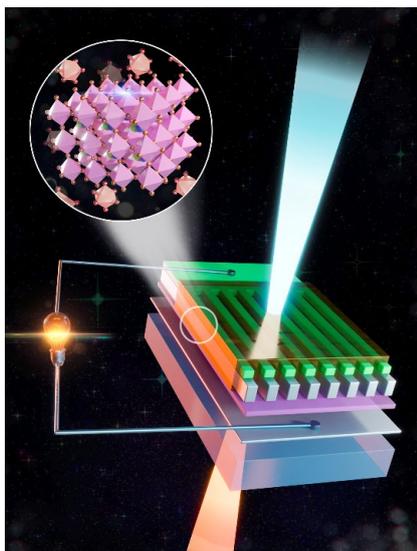


Fig. 1. Illustration of the structure of back-contact perovskite solar cells

Perovskite solar cells (PSCs), due to their ability to produce high (>25%) power conversion efficiencies, have been recognized as one of the most promising technologies in contemporary photovoltaic (PV) research. The standard PSC devices have a sandwich-like architecture, in which the perovskite layer is placed between thin-layer materials referred to as electron and hole transporting layers (ETL and HTL). In recent years, an alternative architecture known as back-contact design (see Fig. 1) has been proposed to further increase the light-harvesting ability of PSCs and, thus, enhance device efficiency.

Prof. Askhat Jumabekov and his team at Physics Department are working in the emerging field of perovskite PV, developing PSCs with improved architecture and functionality. Prof. Jumabekov and his team members Dr. Hryhorii Parkhomenko and Dr. Zarina Umatova in collaboration with researchers from Al-Farabi Kazakh National University (Dr. Erik Shalenov and Prof. Karlygash Dzhumagulova) have developed flexible back-contact perovskite solar cells (BC-PSCs) on plastic substrates (Fig. 2).

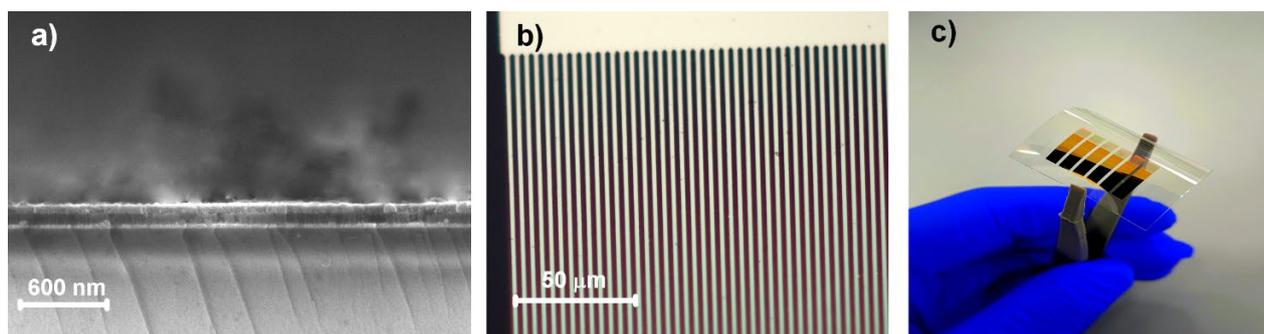


Fig. 2. (a) Electron microscope, (b) optical microscope, and photographic images of flexible back-contact electrodes on plastic substrates, which were developed in the group of Prof. Jumabekov and used to fabricate flexible BC-PSCs.

Developing flexible PV and other optoelectronic devices are of high interest due to their lightweight nature, portability, and low manufacturing cost, along with the possibility of integrating them into other technologies, which promises many potential lucrative applications of this technology in wearable electronics, the internet of things (IoT), smart buildings, the automobile industry, etc. Hence, the research endeavors of Prof. Jumabekov and his team have a significant value in device engineering and industrial manufacturing. The research findings of Prof. Jumabekov and his team concerning this project have been recently published in the *Journal of Energies* (IMDP):

H.P. Parkhomenko, E.O. Shalenov, Z. Umatova, K.N. Dzhumagulova, A.N. Jumabekov, Fabrication of Flexible Quasi-Interdigitated Back-Contact Perovskite Solar Cells. *Energies* 15, 3056 (2022). DOI: <https://doi.org/10.3390/nano12152615>

COMMUNICATED BY DR. ASKHAT JUMABEKOV

VARIATION OF PROTEOLYTIC CLEAVAGE SITES TOWARDS THE N-TERMINAL END OF THE S2 SUBUNIT OF THE NOVEL SARS-COV-2 OMICRON SUBLINEAGE BA.2.12.1.

Nadine Schilling, Hubert Kalbacher, Timo Burster. 2022.

Molecules (IF: 4.927. SJR: 0.71, Q1);

<https://doi.org/10.3390/molecules27185817>



Dr. Timo Burster

The prevalence of novel SARS-CoV-2 variants is also accompanied by an increased turnover rate and additional cleavage sites at the positions necessary for priming the Spike (S) protein. Of these priming sites, the proteolytically sensitive polybasic sequence of the activation loop at the S1/S2 interface and the S2' location within the S2 subunit of the S protein is cleaved by furin and TMPRSS2, which are essential for the infection of the target cell. Neutrophils, migrating to the site of infection, secrete serine proteases to fight against pathogens. The serine proteases encompass neutrophil elastase (NE), proteinase 3 (PR3), and cathepsin G (CatG), which can hydrolyze the peptide bond adjacent to the S1/S2 interface. SARS-CoV-2 might take the opportunity to hijack proteases from an immune response

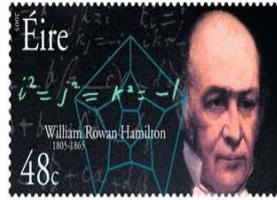
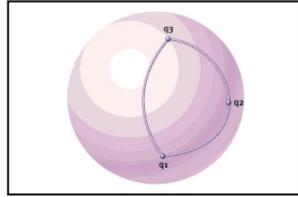
to support viral entry to the cell. The region near S704L within the S2 subunit, a novel amino acid substitution of SARS-CoV-2 Omicron sublineage BA.2.12.1, is located close to the S1/S2 interface. We found that NE, PR3, and CatG digested the peptide within this region; however, the S704L amino acid substitution altered cleavage sites for PR3.

In conclusion, such an amino acid substitution modifies S2 subunit antigen processing and might further impact the major histocompatibility complex (MHC) binding and T cell activation. The generation of a different set of antigenic peptides being loaded to MHC molecules, due to the different antigen processing capacities of PR3 based on the novel S704L mutation, might not be recognized by memory T cells. Hypothetically, this could be an additional reason for immune evasion and the impaired immune response of vaccinated individuals.

Quaternion and Octonion Algebras H and O and the Rings H/\mathbb{Z}_p and O/\mathbb{Z}_p

Dr. Michael Aristidou

Dept. of Mathematics



Are there numbers in higher dimensions? We study some higher dimensional numbers, namely quaternions and octonions, and we are interested in their history, algebra, and applications. It turns out that, beyond their interesting and important algebraic structure, these numbers have some useful applications in Computer Science (3-d animations, Cryptology, etc.), Robotics (robotic arm motion), Quantum Mechanics (elementary particles and forces), and Molecular Biology (protein structure).

The quaternions, denoted by H , were first invented by W. R. Hamilton in 1843 as an extension of the complex numbers into four dimensions [5]. Algebraically speaking, H forms a division algebra (skew field) over \mathbb{R} of dimension 4 ([5], p.195-196). Interestingly, several well-known theorems and algebraic properties do *not* hold in H . Most notably, the Fundamental Theorem of Algebra is not true over H . For example, the equation $x^2 + 1 = 0$ has ∞ -many solutions.

1. H and O . Questions

(a) Solving equation in H is, in general, not an easy business. How to solve $axa = b$, $(ax)b = c$ or $ax^2 + bx + c = 0$? Are there any formulas to solve these? [9, 10].

(b) What other interesting properties fail in H ? Consider for example the 2×2 quaternionic matrix

$A = \begin{pmatrix} i & -j \\ -j & i \end{pmatrix}$. A is invertible, but $\det A = 0$! Is there a way to restore this property?

(c) The main feature of quaternions is that they model rotations in 3-d. Examine applications of H in Physics, Chemistry, Biology, Robotics, Computer Science, etc.

(d) Examine similar things, as in (a), (b) and (c), for the octonions O (i.e. the last of the four division algebras).

In [2], we studied the finite ring H/\mathbb{Z}_p , where p is a prime, looking into its structure and some of its properties. Interestingly, H/\mathbb{Z}_p is not a division algebra. In another paper, we examined idempotent elements in H/\mathbb{Z}_p and provided conditions for idempotency in H/\mathbb{Z}_p . (conditions for tripotency were given in [11]). For example, we proved the following result:

Theorem: Let $x = a_0 + a_1i + a_2j + a_3k \in H/\mathbb{Z}_p$. Then, x is idempotent if $a_0 = \frac{p+1}{2}$ and $a_1^2 + a_2^2 + a_3^2 = \frac{p^2-1}{4}$.

2. H/\mathbb{Z}_p and O/\mathbb{Z}_p . Questions

(a) How many idempotents are there in H/\mathbb{Z}_p ? This would involve finding how many ways $(p^2-1)/4$ can be written as a sum of three or fewer squares. The equation $a_1^2 + a_2^2 + a_3^2 = (p^2-1)/4$ brings to mind the classical 'Sum of Three Squares Theorem' which was proved by Gauss in his *Disquisitiones Arithmeticae*

(S.291) in 1801. As that theorem says, an integer n can be the sum of three squares if and only if $n \neq 4^m(8k+7)$, $n, m \geq 0$. So, clearly, when $n = 7$ one does not have solutions to the equation $a_1^2 + a_2^2 + a_3^2 = n$. But, in our case (in this special 'modp' version), one does get solutions for $p = 7$ to the equation $a_1^2 + a_2^2 + a_3^2 = (p^2 - 1)/4$. In particular, $(4, 1, 3, 4)$ is a solution and hence $x = 4 + i + 3j + 4k$ is an idempotent in H/Z_7 . More interestingly, we get solutions even if $(p^2 - 1)/4 = 4^m(8k+7)$, $n, m \geq 0$. For example, for $p = 31$: $(p^2 - 1)/4 = 240 = 4^2(8 \cdot 1 + 7)$, but $240 = 209 = 23 \pmod{31} = 8^2 + 9^2 + 8^2$ (and the idempotent is $16+8i+9j+8k$). Finally, notice that $2+i+j$ is an idempotent in H/Z_3 , but $(p^2-1)/4 = (3^2-1)/4 = 2$ is not the sum of three squares in Z_3 . In a very recent article [4], it was actually computed that the number of idempotents in H/Z_p is $p^2 + p + 1$. One could compute the number of tripotent elements in H/Z_p .

(b) Another question is to examine nilpotent elements in H/Z_p . Find conditions for nilpotency and the number of nilpotent elements in H/Z_p . Also for square elements, as well as units in H/Z_p . Regarding the units, recently in [4] it was shown that the number of zero-divisors is $p^3 + p^2 - p$, and also mentioned that the group of units has two generators.

(c) A study of H/Z_{p^n} . Is anything significantly different here than over Z_p ? Also, the structure of H/Z_n in general, where n is not a prime.

(d) Another project is to look at the structure of O/Z_p , where O is the octonionic division algebra, and discuss idempotent, nilpotent and tripotent elements in that finite ring. (for idempotent and nilpotents see [12]).

(e) Finally, examine applications of H/Z_p and O/Z_p . k -potent elements of the former and idempotent elements of the later found applications in cryptography. [13, 14]

References

1. N. C. Ankeny, "Sum of Three Squares", *Proceedings of the AMS*, Vol.8, No.2, p.316-319, 1957.
2. M. Aristidou and A. Demetre, "A Note on Quaternion Rings over Z_p ", *International Journal of Algebra*, Vol.3, No.15, p.725-728, 2009.
3. I. N. Herstein, *Topics in Algebra*, 2nd ed., Wiley, 1975.
4. C. J. Miguel and R. Serodio, "On the Structure of Quaternion Rings over Z_p ", *International Journal of Algebra*, Vol.5, No.27, 1313-1325, 2011.
5. R. S. Pierce, *Associative Algebras*, Springer, 1982.
6. R. Remmert et al, *Numbers*, Springer, 1991.
7. R. Schafer, *An Introduction to Nonassociative Algebras*, Academic Press, 1996.
8. J. P. Serre, *A Course in Arithmetic*, Springer, p.45, 1973.
9. I. Niven, "Equations in quaternions", *Amer. Math. Monthly* 48, 654-661, 1941.
10. Y. Tian, "The equations $ax-xb = c$, $ax-xb = c$ and $xax = b$ in quaternions", *Southeast Asian Bull. Math.* 28 (2), 343-362, 2004. .
11. M. Aristidou and K. Hailamariam, "Tripotent Elements in Quaternion Rings over Z_p ", *Acta Univ. Sapientiae Mathematica*, Vol.13, 1, 78-87, 2021.
12. M. Aristidou, P. Brown and G. Chailos, "Idempotent and Nilpotent Elements in Octonion Rings over Z_p ", *Stud. Univ. Babe_s-Bolyai Math.*, 2022. (to appear)
13. Y. Wu, "k-Potent Matrices - Construction and Applications in Digital Image Encryption", *Recent Advances in Applied Mathematics, Proceedings of the 2010 American Conference on Applied Mathematics*, USA, 455-460, 2010.
14. E. Malekian and A. Zakerolhosseini, OTRU: A non-Associative and High Speed Public Key Cryptosystem, 15th CSI International Symposium on Computer Architecture and Digital Systems, Iran, 83-90, 2010.



School of Engineering & Digital Sciences

A NEW MODEL FOR ANALYTICAL PREDICTIONS OF CONCRETE PUMPING

Concrete is used more than any other man-made material in the world. It is irreplaceable for innumerable large infrastructure developments, including buildings, roads, bridges, high-speed railway structures, hydro-power, wind-power, and nuclear-power structures. Pumping of concrete (see Figure 1) is a common placement method and is of utmost importance for modern concrete construction. Over the past, significant advances have been made to demystify concrete pumping from both a practical and a fundamental point of view. However, as can be seen from a large number of recent research articles (see e.g., Refs. [1-2]), pumping of concrete is still an active area of research, and many open research questions remain.



Fig 1. Pumping of concrete in action. Adapted from figures on the internet.

In a recent work carried out by associate professor Yanwei Wang with three undergraduate students (Balnur Zhaidarbek, Aruzhan Tleubek, and Galymbek Berdibek) at the Department of Chemical and Materials Engineering, School of Engineering and Digital Sciences (SEDS) of Nazarbayev University, the team extended analytical predictions of concrete pumping to rheological models beyond the linear Bingham model. Analytical results are presented for the shear rate distribution, velocity distribution, and pressure loss vs. volumetric flow rate relations based on the two-fluid Herschel-Bulkley model and separately based on the two-fluid modified Bingham model. Since the Bingham fluid model can be considered a particular case of the Herschel-Bulkley model or the modified Bingham model, the analytical expressions obtained by Kaplan et al. [3] and by Khatib and Khayat [4] for the two-fluid Bingham model can be recovered under the corresponding simplifications. With those analytical expressions, volumetric flow rate vs. pressure loss curves (see Figure 2) can be readily constructed, given values for the rheological properties of the bulk concrete, rheological properties of the fluid in the lubrication layer, pipe radius, and thickness of the lubrication layer.

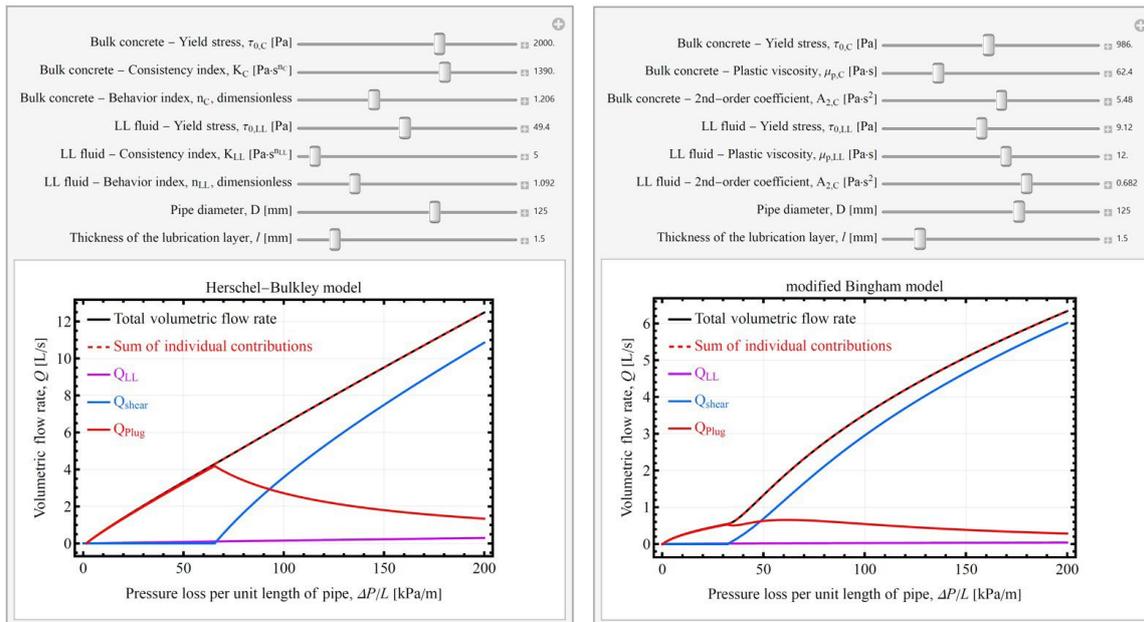


Fig 2. Demonstrations of our recent work on a new model for analytical predictions of concrete pumping that considers the non-Bingham behavior of fresh concrete

The full research article is Under Review for publication. A preprint of the article [5] is available at SSRN. The team has also developed demonstration Apps that implement the mathematical models. An example (see Figure 3) is published on the Wolfram Demonstrations Project website [6]. More sophisticated demonstration apps will also be submitted for publication on the Wolfram Demonstrations Project website after the research article is accepted for publication.

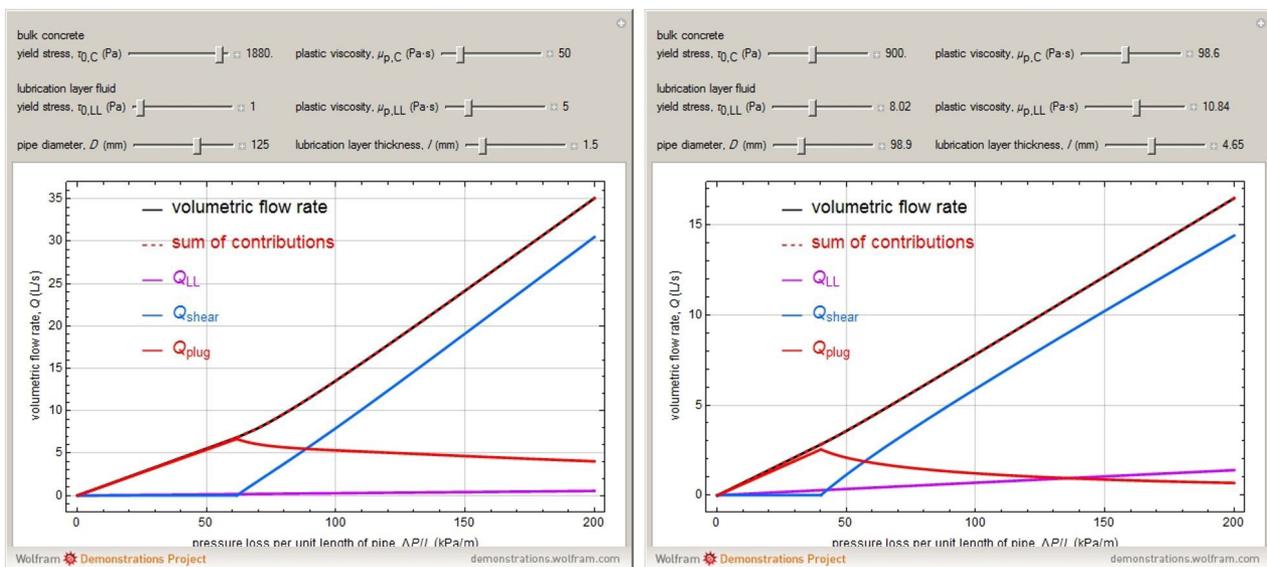


Fig 3. A demonstration APP that has been published on the Wolfram Demonstrations Project website. The source code can be downloaded for free

About the Authors:

Balnur Zhaidarbek and Aruzhan Tleubek are 3rd-year undergraduate students of Nazarbayev University, majoring in chemical and materials engineering. Galymbek Berdibek is a 4th-year undergraduate student of Nazarbayev University, majoring in chemical and materials engineering. Dr. Yanwei Wang is associate professor of Chemical and Materials Engineering at SEDS. He is also head of the laboratory of Computational Materials Science, Center for Energy and Advanced Materials Science (CEAMS), National Laboratory Astana (NLA) and a senior member of the International Union of Laboratories and Experts in Construction Materials, Systems and Structures (RILEM) and a member of the RILEM Technical Committee on Pumping of Concrete.



Balnur Zhaidarbek



Aruzhan Tleubek



Galymbek Berdibek



Yanwei Wang

Fig 4. List of the authors of our work described in this newsletter

1. De Schutter, G., & Feys, D. (2016). Pumping of fresh concrete: insights and challenges. RILEM Technical Letters, 1, 76-80.
2. Feys, D., De Schutter, G., Fataei, S., Martys, N. S., & Mechtcherine, V. (2022). Pumping of concrete: Understanding a common placement method with lots of challenges. Cement and Concrete Research, 154, 106720.
3. Kaplan, D., de Larrard, F., & Sedran, T. (2005). Design of concrete pumping circuit. ACI materials journal, 102(2), 110.
4. Khatib, R., & Khayat, K. H. (2021). Pumping of Flowable Concrete: Analytical Prediction and Experimental Validation. ACI Materials Journal, 118(5).
5. Zhaidarbek, B., Tleubek, A., Berdibek, G. & Wang, Y. (2022). Analytical Predictions of Concrete Pumping: Extending the Khatib-Khayat Model to Herschel-Bulkley and Modified Bingham Fluids. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.4188701>
6. Zhaidarbek B. & Wang, Y. (2022). «Khatib-Khayat Model for Pumping Flowable Concrete». Wolfram Demonstrations Project. Available at <http://demonstrations.wolfram.com/KhatibKhayatModelForPumpingFlowableConcrete/>

FOSTERING RESEARCH AND INNOVATION POTENTIAL (FRIP) PROGRAM AWARDED UNDERGRADUATE RESEARCHERS IN BIOMATERIALS AND REGENERATIVE ENGINEERING LABORATORY (BIREL) WITH A 1.5M KZT



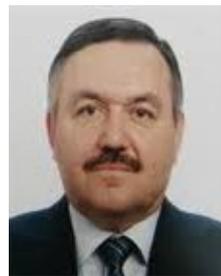
Mr. B. Mirasbek



Ms. A. Zhakypbekova



Ms. L. Timur



N.K. Arda, M.D.



C. Erisken, PhD.

A group of undergraduate researchers in BIREL, a research group under the Department of Chemical and Materials Engineering, earns 1.5M KZT under a call topic of Sustainable Development of Kazakhstan. Mr. Mirasbek (leading researcher), Ms. Zhakypbekova and Ms. Timur are the researchers of the project titled “*PLGA nano-droplets Encapsulated in Liposome for Controlled Transforming Growth Factor - beta3 delivery*”. Dr. Erisken (Ph.D.) from Nazarbayev University and Dr. Kemal Arda (M.D.) from Gulhane School of Medicine at University of Health Sciences (Ankara, TR) will serve as the faculty consultant and the external consultant, respectively.

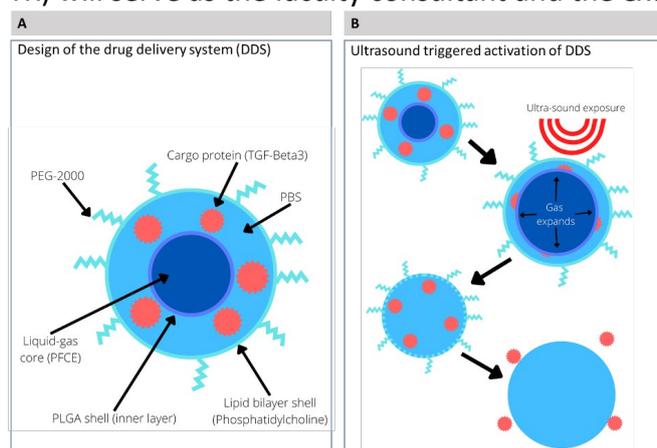


Fig. 1 Schematics of the design and activation of the controlled delivery device

The proposed study focuses on the development of a nanostructured system (Fig. 1), which combines an Ultrasound Contrast Agent (UCA) with a drug delivery system (DDS). The final product is to be constructed by formulating Perfluoro-15-crown-5-ether (PFCE) nanodroplets at the core covered by a shell of poly(lactic-co-glycolic acid), which together was encapsulated in a liposome. The UCA includes nanobubbles/microbubbles, which have a liquid-gas interface that provides superior echogenic properties. When exposed to ultrasound waves, the bubbles provide strong distinguishable echo and disrupt to

release of the hydrophobic core. Meanwhile, nanodroplets undergo acoustic droplet vaporization and hence droplet-to-bubble transition. The delivery system properties are determined by the second layer of lipid bilayer stabilized by poloxamers, which contains Transforming Growth Factor Beta-3 (TGF- β 3). TGF- β 3 is a protein known to contribute to cartilage regeneration by improving chondrocyte activity to proliferate and produce extracellular matrix components including collagen and glycoproteins. In this study, it is hypothesized that the directed ultrasound exposure of the PLGA shell of nanodroplet will undergo droplet to bubble transition, and rupture the lipid shell of the liposome, thus releasing the protein. The proposed drug delivery system is expected to contribute to the repair/regeneration of the cartilage in osteoarthritis.

Specifically, the DDS will be designed, fabricated and characterized. Then, an in-vitro controlled release study will be performed to determine the efficacy of the DDS to release TGF- β 3. A follow up study will include evaluation of in-vitro performance of chondrocytes in the presence of TGF- β 3 released from nanobubbles upon US disruption. This will provide us with proof of concept data for the effect of TGF- β 3 loaded nanobubbles on the cartilage formation/regeneration.

This proposed project is related to Goal #3 of the United Nations Sustainable Development program and is aimed to improve the quality of life of people of Kazakhstan from different age groups.

DR. STAVROS G. POULOPOULOS AND PH.D. STUDENTS



Dr. Stavros G. Pouloupoulos



Yerkanat Kanafin PhD student



Saule Mergenbayeva PhD student

Professor Stavros G. Pouloupoulos's lab research group investigates the degradation of emerging organic pollutants in synthetic wastewater/ wastewater water by means of advanced oxidation processes (AOPs), including heterogeneous photocatalysis and photochemical processes (such as photo-Fenton and photo-Fenton-like). The group recently published their results in Q1 journals:

1. Treatment of a poultry slaughterhouse wastewater using advanced oxidation processes by Yerkanat N. Kanafin, Ardak Makhatova, Kulyash Meiramkulova and Stavros G. Pouloupoulos. The research team studied the photochemical treatment of real poultry slaughterhouse wastewater. The results of the study were published in Journal of Water Process Engineering (Q1, IF: 7.34) and can be found on the following [link](#).

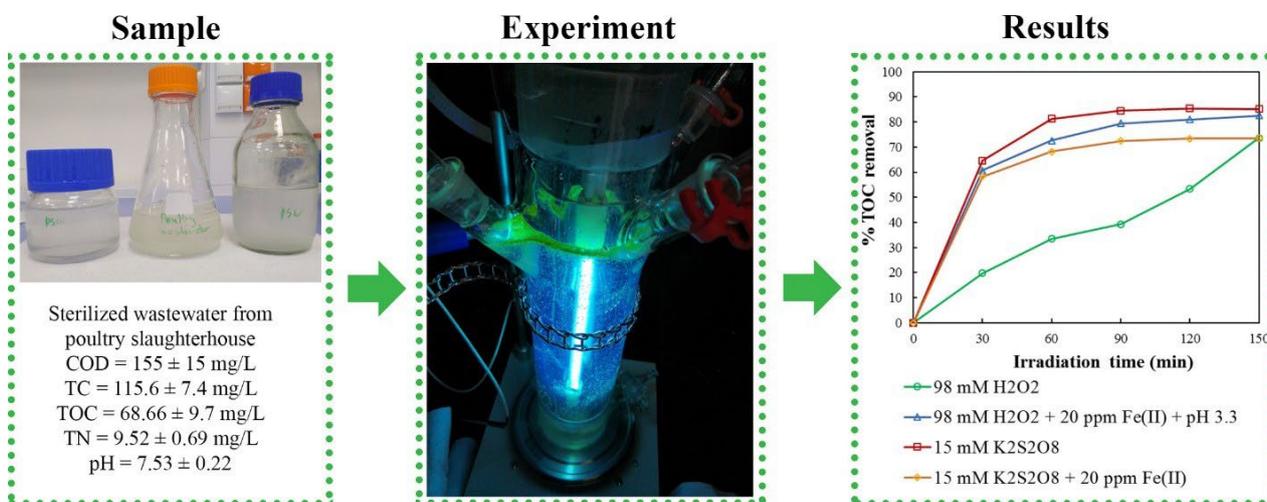


Fig 1. Graphical abstract of the paper

The possible inhibition associated with biological treatment and the tightening of discharge regulations motivate the exploration of complimentary techniques for wastewater treatment such as advanced oxidation processes (AOPs). AOPs are commonly based on the chemical reaction with hydroxyl or sulfate radicals in the presence of UV light and a catalyst. These radicals are non-selective, have very high oxidation potential and rapid reaction rates, resulting in shorter residence times and mineralization of organics. Moreover, AOPs can be used for disinfection purposes [1,2]. Currently, AOPs are considered as an attractive alternative or additional treatment option to conventional biological treatment of slaughterhouse wastewater (SWW) and have been investigated by a number of research group.

In the present study, different chemical species such as hydrogen peroxide, potassium persulfate, titanium dioxide, and iron salts were employed for the treatment of a real poultry slaughterhouse wastewater (poultry-SWW) under UV-C light (254 nm). The experiments lasted 150 min and were carried out in a batch photoreactor aiming at investigating the most efficient operating conditions in terms of total organic carbon (TOC) removal. UV photolysis or Fe-doped TiO₂ photocatalysis were practically inefficient, while application of un-doped TiO₂ resulted in 44% TOC removal after 60 min of UV irradiation. The use of 98 mM H₂O₂ under UV light led to 74% TOC removal after 150 min. The addition of Fe(II) ions to this system coupled with initial pH adjustment to 3 increased the TOC removal to 82.5% after 150 min. Finally, the combination of UV with 15 mM of K₂S₂O₈ resulted in 85% TOC removal. This was the first time when the persulfate oxidation was successfully applied for SWW treatment. To assess the energy efficiency of the various photochemical treatment processes tested, estimation of the electric energy per order (EEO, kWh/m³/order) was conducted. The lowest EEO value of 226 kWh/m³/order was observed for the UV/K₂S₂O₈ process and compared with other photochemical treatment technologies. The effluent quality of UV/K₂S₂O₈ treatment comply with the discharge water quality standards of the developed countries. Therefore, it is possible to use UV/K₂S₂O₈ process as a post-treatment after biological treatment of SWW to meet the discharge water standards and reuse the wastewater.

2. Degradation of 4-Tert-Butylphenol in Water Using Mono-Doped (M1: Mo, W) and Co-Doped (M2-M1: Cu, Co, Zn) Titania Catalysts by Saule Mergenbayeva, Alisher Kumarov, Timur Sh. Atabaev, Evroula Hapeshi, John Vakros, Dionissios Mantzavinos and Stavros G. Pouloupoulos.

The research team prepared mono-doped (Mo-TiO₂ and W-TiO₂) and co-doped TiO₂ (Co-Mo-TiO₂, Co-W-TiO₂, Cu-Mo-TiO₂, Cu-W-TiO₂, Zn-Mo-TiO₂, and Zn-W-TiO₂) catalysts and evaluated their catalytic activities for the degradation of 4-tert-butylphenol (4-t-BP) under UV/solar light irradiation. The results of the study were published in *Nanomaterials* (Q1, IF: 5.719) and can be found on the following [link](#).

4-t-BP is an industrial chemical used as a raw material for the production of synthetic phenol and polycarbonate resins. As a representative of EDCs, 4-t-BP has a high estrogenic effect and acute/chronic environmental toxicity. Considering its adverse effects on human health and aquatic systems, 4-t-BP, as a highly persistent pollutant, needs to be controlled efficiently.

Heterogeneous photocatalysis may be considered an economically feasible solution to remove 4-t-BP from water due to the competitive cost of the process and the ambient conditions of temperature and pressure. In the present work, mono-doped (Mo-TiO₂ and W-TiO₂) and co-doped (Co-Mo-TiO₂, Zn-Mo-TiO₂, Co-W-TiO₂, Cu-Mo-TiO₂, Cu-W-TiO₂, and Zn-W-TiO₂) catalysts were synthesized through simple impregnation methods. The as-prepared samples were characterized by means of SEM, TEM, XRD, Raman, and UV–VIS DR spectroscopies to study their morphology, textural properties, crystal structure, and optical properties. The XRD patterns revealed the presence of peaks corresponding to the WO₃ in W-TiO₂, Co-W-TiO₂, Cu-W-TiO₂, and Zn-W-TiO₂. The co-doping of Cu and Mo to the TiO₂ lattice was evidenced by the shift of XRD planes towards higher 2θ values, confirming the lattice distortion. Elemental mapping images confirmed the successful impregnation and uniform distribution of metal particles on the TiO₂ surface. Compared to undoped TiO₂, Mo-TiO₂ and W-TiO₂ exhibited a lower energy gap. Further incorporation of Mo-TiO₂ with Co or Cu introduced slight changes in energy gap and light absorption characteristics, particularly visible light absorption. In addition, photoluminescence (PL) showed that Cu-Mo-TiO₂ has a weaker PL intensity than undoped TiO₂. Thus, Cu-Mo-TiO₂ showed better catalytic activity than pure TiO₂, achieving complete degradation of 4-tert-butylphenol under UV light irradiation after 60 min (Fig. 2B). The application of Cu-Mo-TiO₂ under solar light conditions was also tested, and 70% of 4-tert-butylphenol degradation was achieved within 150 min.

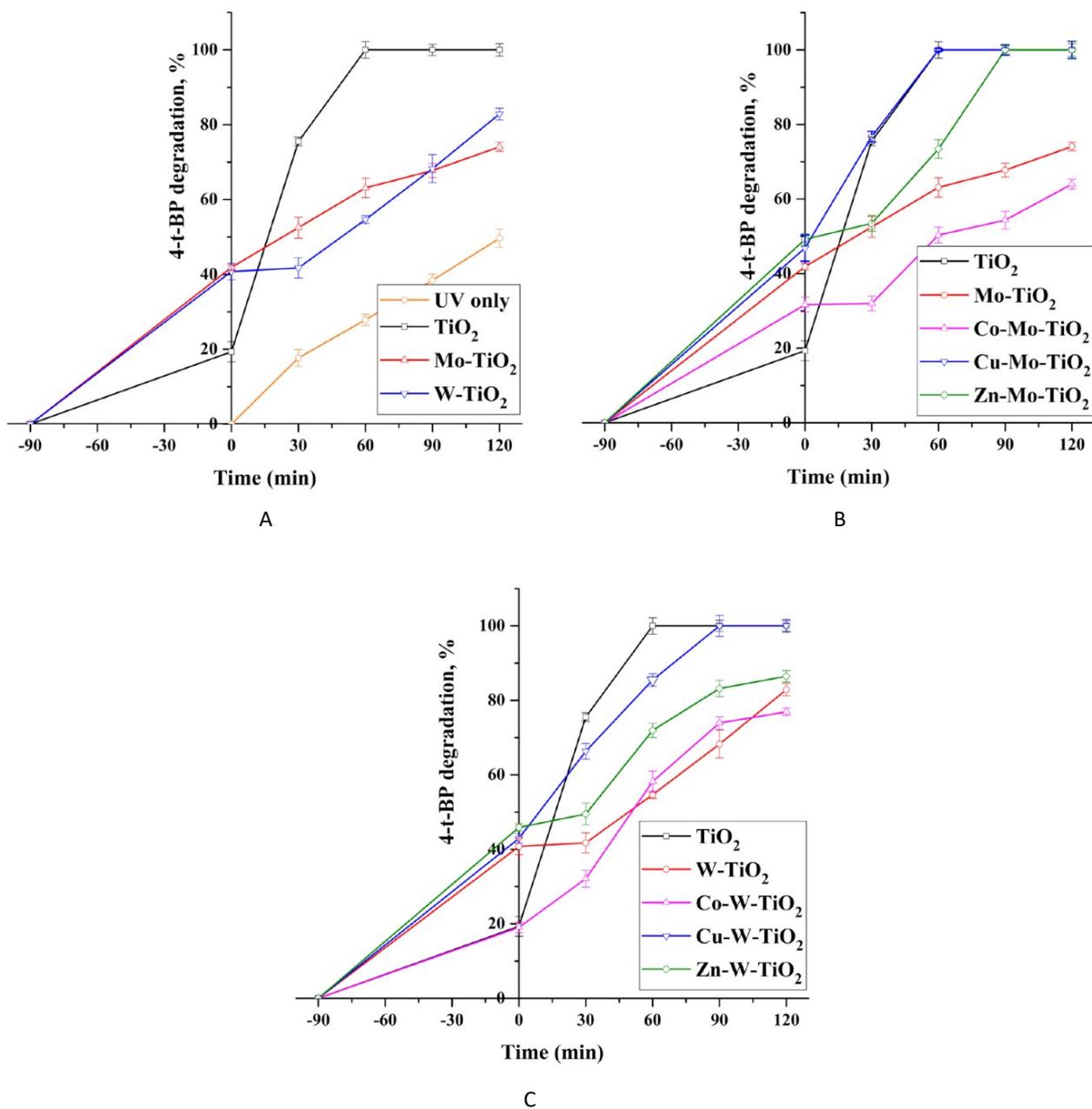


Fig 2. The photocatalytic activity of A) TiO₂, Mo-TiO₂, and W-TiO₂; B) Mo-TiO₂, Co-Mo-TiO₂, Cu-Mo-TiO₂, and Zn-Mo-TiO₂; C) W-TiO₂, Co-W-TiO₂, Cu-W-TiO₂, and Zn-W-TiO₂ under UV irradiation.



Graduate School of Business News



Ona Akemu, Atanu Rakshit, and Kishan PKV have been commissioned by Astana Financial Services Authority to study their regulatory sandbox for new fintech start-ups. This is an exciting development for Kazakhstan, and the study hopes to contribute to the understanding of the co-evolution of regulatory institutions and regulated organizations in nascent industries.

NUGSB RESEARCH SEMINARS:

Following an engaging run of regular Zoom events, GSB has resumed holding research seminars in person. In recent months, GSB hosted presentations from Marat Salikhov (SKOLKOVO) on demand forecasting for new products, Leo Pugachev (RIT) on how customer culture affects bank performance, Arevik Gnuzhmann-Mkrtchyan (LUH) on the use of antidumping by global cartels, Jesus Salas (Lehigh University) on the process of replacing independent directors, George Chondrakis (ESADE Business School) on benefits of variable compensation for firm general counsels, Mariya Teteryatnikova (HSE) on network stability, David Robinson (Duke Fuqua) on obstacles for minorities launching businesses, and Zarema Khon (U. Bath, and now GSB) first on how consumers morally evaluate marketing communications, and second on how consumers form preferences for recommendations from complex algorithms.

GSB is pleased to have arranged the following research seminars in September and October:

- 28th Sept, 17:00, via Zoom, Scott Guernsey (U. Tennessee), “Classified Boards: Endangered species or hiding in plain sight?”
- 12th Oct, 12:30, on campus, Mayowa T. Babola (NUGSB), “On the Sole Pursuits of Profits Over People: Understanding the Implications of Bottom-Line Mentality in Organizations”
- 19th Oct., 12:30, via Zoom, Claire Liu (U. Sydney), “Activist Short Selling and Product Innovation”
- 26th Oct., 12:30, on campus, PKV Kishan ([NURCE](#)), “Business Practices and Entrepreneurial Performance: Does Management Training Improve SMEs’ Performance?”

Seminars, when on campus, are held on Wednesdays from 12:30-13:30 in Block C3 3.037. All interested parties who can access campus are welcome. GSB also still hosts occasional seminars on Zoom with [registration](#) open to the public. GSB seminars are now regularly included in the NU Weekly Events digest, and upcoming seminars can always be found on the GSB website’s [event calendar](#).

NUGSB BUSINESS DIGEST:

The Business Digest Series reports short pieces on research from GSB faculty, highlighting the key takeaways and policy implications, relevant for the wider business community and policymakers.

- [2022/10 Women Entrepreneurship in Kazakhstan and beyond Nazarbayev University Research Center of Entrepreneurship \(NURCE\)](#) by Leila Farraj, Aminanur Chaia, Shumaila Yousafazi
- [2022/11 Technology Entrepreneurship in Kazakhstan: The Challenges of Adaptation and Restart](#) by Onajomo Akemu, Atanu Rakshit
- [2022/12 How women social entrepreneurs are innovating global impact](#) by Leila Farraj, Aminanur Chaia, Shumaila Yousafazi
- [2022/13 Tourism sector in Kazakhstan: an overview Nazarbayev University Research Center of Entrepreneurship \(NURCE\)](#) by Dana Sailaukhanova, Aigerim Yergabulova, Shumaila Yousafazi
- [2022/14 How community-based tourism can alleviate poverty?](#) by Dana Sailaukhanova and Shumaila Yousafazi
- [2022/15 Incubation and Acceleration in Kazakhstan: Foreign Ideas, Local Practices in an Emerging Technology Landscape](#) by Onajomo Akemu, Atanu Rakshit, Dauletzhan Baimukhanov.

CONFERENCE PRESENTATIONS:

- David De Remer presented his study based on data from Almaty at the [Summer Conference of the Association of Environmental and Resource Economists](#) in Miami, Florida, USA on 3 June. The title of the paper: “Mountains of Evidence: The Effects of Abnormal Air Pollution on Crime” (joint with Birzhan Batkeyev of KBTU)

- Atanu Rakshit, Ona Akemu, and Kishan PKV presented their idea and research design for their grant-funded study Failure and Restart among Technology Entrepreneurship at the prestigious [Academy of Management Journal Paper Development Workshop](#) (AMJ-PDW) at the University of Amsterdam in June. The study is now in the data collection phase and is collaborating with the major technology incubators and accelerators in Kazakhstan for that purpose.

- Chandra Pathki presented a research paper at the [Annual Meeting of the Academy of Management \(AOM\)](#) in Seattle, WA, USA in August 2022. The title of the paper: “I Am Impacted by Your Motives, Not by Your Abuse! Effects of Abusive Supervision on Functional and Dysfunctional Voice Behaviors” (joint with Kluemper, D. H., Vudatha, S. & Babalola, M.)
- Mayowa Babalola presented the three papers at the Annual Meeting of the [Academy of Management \(AOM\)](#) in Seattle, WA, USA in August 2022:
 1. “Current Research on Bottom-line Mentality and Future Directions” (joint with Farasat, M. & Quade, M.). Academy of Management Proceedings (Vol. 2022, No. 1, p. 12554).
 2. “Leader Job Insecurity and Leader Self-Serving Behavior” (joint with Qu, Y., Usman, M., & Ali, M.). Academy of Management Proceedings (Vol. 2022, No. 1, p. 14831).
 3. “Antecedents of Proactivity: The Effect of Ethical Climate Through Duty Orientation and Moral Potency” (joint with Gok, K., Lakshman, C., Sumanth, J. J., Decoster, S., & Vo, L. C.). Academy of Management Proceedings (Vol. 2022, No. 1, p. 15319).
- Chandra Pathki presented a research paper at Duke University. The title of the paper: “Streaming media at home and employee outcomes in the workplace”.


- Jozef Konings is presenting a paper at the [Centre for Economic Policy Research \(CEPR\) workshop](#) on 7 October. The title of the paper: “The Impact of Firm-Level Covid-Rescue Policies on Productivity Growth and Reallocation” (joint with Glenn Magerman of ECARES, ULB, CEPR, and Dieter Van Esbroeck of KU Leuven).
- Two FTMBA students (Dana Kanafina and Dana Kamzabek) and Chandra Pathki had their Talent Management case study accepted at the [Asian Management Research and Case Conference \(AMRC\)](#), Dubai. The paper will be presented on October 4th.
- Zarema Khon is presenting a working paper at the [Association for Consumer Research \(ACR\) Conference 2022 Special Session](#) “Gut Feelings: Consumers’ Intuitive Judgments of Companies” on 22 October. Title of the paper: “Dual Process Intuitions: Consumers’ Beliefs about Persuasion Processing Drive Morality of Marketing Communications” (joint with Yi-Ju Chen, Yvetta Simonyan, Haiming Hang of U. Bath, and Samuel Johnson of U. Waterloo).



CENTRE FOR
ECONOMIC
POLICY
RESEARCH



10th Asian Management Research & Case Conference



ADMISSIONS EVENTS:

NUGSB is hosting two demo sessions as a part of NU Open House Day on 25 September:

- Zarema Khon will be talking about [what studying Marketing at a business school is not](#)
- Jiyang Dong will be talking about the importance of data in the age of AI

The previous demo session was held in June, where Mustafa Karatas was talking about the importance of psychological segmentation and targeting the right audience.

PUBLISHED:

- Atanu Rakshit & Jonathan Peterson (2022) Racial disparities in the small business loan market, *Journal of Small Business Management*, <https://doi.org/10.1080/00472778.2022.2108824>
- Babalola, M. T., Bal, M., Cho, C. H., Garcia-Lorenzo, L., Guedhami, O., Liang, H., ... & van Gils, S. (2022). Bringing Excitement to Empirical Business Ethics Research: Thoughts on the Future of Business Ethics. *Journal of Business Ethics*, 1-14. (ABDC A; FT 50; Impact Factor = 6.235).
- Babalola, M.T., Jordan, S., Ren S., Ogbonnaya, C., Hochwarter, W. A., & Soetan, G. (2022). How and when top management bottom-line mentality inhibits servant leadership practices. *Journal of Management*. (ABDC Ranking A*; FT 50, Impact Factor = 11.790).
- Jozef Konings, Galiya Sagyndykova, Venkat Subramanian and Astrid Volckaert (2022) “The granular nature of emerging market economies: The case of Kazakhstan”, *The Economics of Transition and Institutional Change*, forthcoming, <https://doi.org/10.1111/ecot.12346>, impact factor: 0.95
- Gok, K., Babalola, M.T., Summanth, J., Lakshaman, C., Lin, C., & Decoster, S. (accepted). Enhancing employees’ duty orientation and moral Potency: Dual mechanisms linking ethical psychological climate to ethically-focused proactive behaviors. *Journal of Organizational Behavior*. (ABDC Ranking A*, ABS 4, Impact Factor = 8.174).
- Onajomo Akemu and Venkat Subramanian (2022). IB Research Opportunities in Central Asia. In: Merchant, H. (eds) *The New Frontiers of International Business. Contributions to Management Science*. Springer, Cham. https://doi.org/10.1007/978-3-031-06003-8_5

- Ogunfowora, B., Lee, C., Nguyen, V. Q., Babalola, M. T., & Ren, S. (in press). Do moral disengagers experience guilt following workplace misconduct? Consequences for emotional exhaustion and task Performance. *Journal of Organizational Behavior*. (ABDC Ranking A*, Impact Factor = 8.174).
- Usman, M., Rofcanin, Y., Ali, M., Babalola, M.T., & Ogbonnaya, C. (in press). Towards a more sustainable environment: Understanding why and when green training promotes employees' eco-friendly behaviors outside of work. *Human Resource Management*. (ABDC A*; FT 50; Impact Factor = 6.331).

BUSINESS MAGAZINES:

- Gabriele Lattanzio (2022). [Financial literacy matters](#). *Money and Finance Magazine*.
- David De Remer gave his comments on euro-dollar parity in an article "[EU hard-pressed by energy crisis](#)" in *China Daily Global*



WORKING PAPERS:

- [2022/04 Mountains of Evidence: The Effects of Abnormal Air Pollution on Crime](#) by Birzhan Batkeyev, David R. DeRemer
- [2022/05 How binding is supervisory guidance? Evidence from the European calendar provisioning](#) by Franco Fiordelisi, Gabriele Lattanzio, Davide S. Mare
- [2022/06 The Impact of Firm-level Covid Rescue Policies on Productivity Growth and Reallocation](#) by Jozef Konings, Glenn Magerman Dieter, Van Esbroeck
- [2022/07 Dual Process Intuitions: Consumers' Belief about Persuasion Processing Drive Morality of Marketing Communications](#) by Zarema Khon, Yi-Ju Chen, Yvetta Simonyan, Haiming Hang, Samuel G.B. Johnson



NAZARBAYEV
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EDITORIAL WORKS BY PROF. RUSLAN KALENDAR



[Prof. Ruslan Kalendar](#) is a Leading Researcher at the Laboratory of Bioinformatics and Systems Biology, National Laboratory Astana, Centre for Life Sciences. He also holds a position as Associate Editor for the journal [Frontiers in Plant Science](#) (6.627 Impact Factor; 8.0 CiteScore) at Technical Advances in Plant Science. This journal is a leading source in its field, publishing rigorously peer-reviewed research that seeks to advance our understanding of fundamental processes in plant biology. In this issue we would like to share with you some of Prof. Kalendar's editorial works.

Editorial on the Research Topic I: [Innovative Applications of Sequencing Technologies in Plant Science](#)

Sequencing and sequencing technologies are amongst the techniques in life sciences that have brought about a revolution, opening up many possibilities to explore the hidden secrets of life in DNA. Sequencing and sequencing technologies have also advanced to make for more accurate and time-efficient discoveries that can be employed on a large scale. This is particularly useful in plant science research when screening and selecting particular traits of interest. Despite this advancement in sequencing technologies, the full potential this power to explore the genetic code gives is yet to be fully explored. New studies showing innovative ways sequencing has been employed to understand plants better are emerging.

In summary, the research collected on this Research Topic highlights these innovative applications of sequence technologies in Plant Science – such as in genetic mapping, the identification and characterization of candidate genes, innovative use of DNA metabarcoding, expansion of opportunities and solvable problems by PCR technologies, and the novel combination of sequence-based technologies to answer plant science questions aligned with making for a healthy planet.

Editorial on the Research Topic II: [Recent Advances in Plant Genetic Engineering and Innovative Applications](#)

Plant genetic engineering is one of the most popular advances in plant science that has been included in the mainstream societal discussion. This is born out of multiple unresolved debates on genetically modified organisms (GMOs), the involvement of policymakers in an attempt to regulate and ensure its safe application to food crop production, and also featuring as a topic in the politics of global aid. Apart from the GMO debate, however, several advances in genetic engineering have been recorded that empower plant scientists to investigate and solve problems previously untouched.

From the challenge of transforming recalcitrant species and the development of genetic engineering techniques suitable to non-angiosperms to the development of novel genetic engineering technologies and updates to existing technologies, the field of plant genetic engineering is growing and extending the limits of possibilities in Plant Sciences. The extension of plant science research capabilities is particularly important as Plant Science has a significant role in global hot topics such as climate change and sustainability. The goal of this research topic is to highlight studies that embody these advances in new biotechnological tools (NBTs) development and the innovative applications of plant genetic engineering. Studies that focus on NBTs development for recalcitrant or previous non-transformable species to allow the unlocking of the biology of these species are of significant interest to this collection. Furthermore, the application of novel strategies of next-generation genetic engineering technologies such as genome/gene editing and protein-domain specific technology (e.g., K-Domain technology) and innovative applications as well as updates on well-established genetic engineering technologies (e.g., plant artificial minichromosomes and virus-induced silencing) will be explored in this collection. Finally, the innovative combination of artificial intelligence or machine learning with genetic engineering to investigate, solve problems and innovate in plant science is sought after for this collection.

Editorial on the Research Topic III: *Interspecific Hybridization in Plant Biology*

Many crop gene pools are derived from small numbers of founders. As a consequence of long histories of strong directional selection, crop gene pools have narrow genetic diversity available to provide inherent solutions to changing needs or challenges. Notoriously, plants can mate across taxonomically-determined species boundaries, and interspecific hybridization is widely used in plant genetics research. Interspecific hybridizations have conferred practical improvements to crops, some of which are unexpected based on the phenotypes of the parents. Genomics has provided insights into the fundamental consequences of interspecific hybridization for plant biology. Additionally, genomics has allowed the development of molecular tools for dissecting the genetic control of phenotypic variation in interspecific hybrid populations and manipulating interspecific introgressions in crop improvement.

This Research Topic aimed to publish peer-reviewed research on plant interspecific hybridization and its consequences, both fundamental and applied. While such work is prominent in plants, consideration will also be given to salient work in other taxa. A key threshold for publication was the extent to which findings are of cross-cutting interest and importance, i.e., not only to those working on the target taxon but also to a wide range of biological scientists. As a result, 15 articles were published.

In summary, the research collected on this topic facilitated understanding of issues related to interspecific hybridization in plant biology. We believe that this platform for enhancing exchange and promoting development has merit to be continued regarding some issues such as genomics of natural or synthetic polyploid formation, genomic responses to interspecific hybridization, transmission genetics across species boundaries, and genomics of interspecific hybrid heterosis.

Editorial on the Research Topic IV: *Spectroscopy for Crop and Product Phenotyping*

Spectroscopy is a viable technique for exploring plant biochemistry in a time-efficient, accurate, and typically non-destructive manner. By taking advantage of the properties of plant biomolecules and metabolites in different regions of the electromagnetic spectrum, advances have been made that allow for investigations into previously inaccessible aspects of biology in real time. Other important advances involve disease diagnostics, early stress detection, and plant product quality assessment.

This research topic aims to highlight novel and innovative applications of all spectroscopic techniques in plants with the goal of characterization for the understanding of plant growth and productivity. Studies featuring impactful and innovative applications of well-established methodologies such as Raman Spectroscopy, Near-infrared spectroscopy, FRET, hyperspectral imaging, and a novel combination of spectrometric measurement techniques and novel spectrometric techniques are invited.

References

- Kalendar R, Orbovic V, Egea-Cortines M, Song G-Q 2022. Editorial: Recent Advances in Plant Genetic Engineering and Innovative Applications. *Frontiers in Plant Science*, 13: 1045417. DOI: 10.3389/fpls.2022.1045417 <https://www.frontiersin.org/articles/10.3389/fpls.2022.1045417/full>
- Tao D, Kalendar R, Paterson AH 2022. Editorial: Interspecific Hybridization in Plant Biology. *Frontiers in Plant Science*, 13: 1026492. DOI: 10.3389/fpls.2022.1026492 <https://www.frontiersin.org/articles/10.3389/fpls.2022.1026492/full>

WHAT DOES PEACE LOOK LIKE? A CONVERSATION ON PEACE AND RACISM

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In celebration of the [UN International Day of Peace](#) on the 21st of September, the NU Library in partnership with NU SG-Ministry of Education and the Office of the International Students and Scholars Services held an event entitled **What Does Peace Look Like?: A Conversation on Peace and Racism** at the Active Learning Room, NU Library on strengthening the ideals of peace in the NU community. In line with this year's theme, **End Racism. Build Peace**, this event aims to: (1) create a safe space to foster conversation and dialogue; (2) reduce stereotypes among different groups of people and races; (3) strengthen the ideals of peace through understanding and appreciation of various cultures; and (4) promote inclusivity and diversity among members of the NU academic community.



Fig 1. Some of the attendees of the event

Now in its 2nd year, the event was in line with the *UNSDG Goal 16: Promote just, peaceful and inclusive societies*. The event featured lightning talks from remarkable storytellers who would like to share their stories in line with the theme of the event. As a pre-event, a Free Mic was set at the Atrium to encourage conversation and dialogue addressing the question *What Does Peace Look Like?*

Free Mic

The idea behind the free mic was to encourage everyone to grab the microphone and say something about peace by making it one line, speaking their mind, and having the option to be anonymous or be famous. Participants talked about whatever answers or wishes they had. The answers varied from personal feelings about Peace to universal meanings. The recording of Free Mic will be uploaded on the Library YouTube channel.

Lightning Talks

The first lightning talk was given by Dinara Pisareva, an Assistant Professor at the Department of Political Science and International Relations at the School of Sciences and Humanities. It was a brief introduction to the current state of the world, the war between Russia and Ukraine, and the border clashes between Kyrgyzstan and Tajikistan. Even though the participants were not affected by this situation at the moment, a very interesting discussion happened, signifying that these things should be talked about and not kept silent.



Fig 2. Dinara Pisareva giving talk on peace

Muhammad Awais Jamali, a graduate student from the School of Engineering and Digital Science (SEDS) expressed that peace cannot be imagined without war further denoting that to stay in peace, people should always be prepared for war. He briefly described and presented the images of how the war affected peace in Pakistan, especially the Indian-Pakistan Kashmir war, the 9/11 situation, and the aftermath of these wars to the victims. Hence, in his viewpoint, to stay in peace means to be ready for war.



Fig 3. Muhammad Awais Jamali giving a talk about peace in Pakistan

For Mohammad Habib Abdullah, a 2nd-year Public Administration student from the Graduate School of Public Policy (GSPP), Peace is the absence of war. He shared his childhood experiences in Afghanistan when they left their country with a fear of death. They have been surviving, and they didn't know what peace looks like. Thus, for them, Peace is the absence of war.



Fig 4. Mohammad Habib Abdullah shared thoughts about the meaning of Peace in Afghanistan

A different viewpoint of what Peace looks like was shared by Kebir Mohammed Jemal, also a graduate student from SEDS. For him, Peace equates to equality, acceptance, and harmony with nature, inner balance, and progress. Peace is subjective and it can be interpreted differently by each person. According to him, Peace is not just the absence of war; it is something abstract and each person has his own understanding.



Fig 5. Kebir Mohammed Jemal wondering about the subjectivity of Peace

Gaziza Tariq from the Library shared her story about how interracial couples could be judged by society. What are the struggles that they should overcome to live their lives and be together? She mentioned the judgment and sidelong glances of society, which they were asked to leave, and they even received physical maltreatment from strangers. It was quite a hard story to listen to but it was indeed a topic that should not be ignored. Thus, society should work on the tolerance of interracial couples and overcome such situations.



Fig 6. Gaziza's personal story

Group Conversations

The event became a safe space and a good venue for discussion. With the informal and conversational atmosphere of the event, the participants were able to express freely their opinions and thoughts on topics that are still taboo to them up to this day. As Peace takes a lot of different meanings and is very subjective, the discussion has even become more fruitful and thought-provoking. Topics on wars, racism, and LGBTQ were some of the things that have been discussed. Asking braver questions and straightforward, no holds barred stands were the name of the game and it was indeed very meaningful to witness how the discussions became even more mature as more and more minds were heard with ears that are very much eager to listen. Despite such differences in views, the participants were satisfied with how the discussion went. The participants were able to maintain an atmosphere of respect throughout the discussion. In the end, the event was indeed a success as it was able to achieve its main goal--to promote the ideals of peace in the NU community.

So What Does Peace Look Like?

There is no single answer to what peace looks like. As this is very subjective, everyone can have their take on peace. As Martin Luther King (1965) said, "peace is not merely the absence of tension, but the presence of justice". It doesn't mean that if we do not experience war at the moment, we have peace. Think of those who don't have any food on their plate, those who lost their jobs and careers during the crisis, those who are grieving because of the loss of their loved ones, those who are struggling to find their place and identity, and those who are trying to make ends meet. They are not in a bloody war, but they still don't feel peace either. It was hoped that the event will help foster peace and some realizations not just inside the university, but more so when we go out of campus.

Reference:

- King, M. L. (1956). When Peace Becomes Obnoxious 1956. *The Papers of Martin Luther King, Jr. Volume III: Birth of a New Age*, December 1955, 207-208.

RESEARCH PUBLICATIONS PERFORMANCE

Co-authored publications per country/region:



collaborating Institutions

● Top 10 institutions worldwide by co-authored publications



In this issue, we are delighted to present you an overview of research activities conducted under the auspices of Nazarbayev University. Since its inception in 2011, Nazarbayev University faculty members and researchers have released 6,434 peer-reviewed publications indexed by Scopus, and have been cited 58,659 times for 2011-2022 period (SciVal, October 2022). The approximate number of citations per peer-reviewed publication is 9.1. The overall H-index of NU is 73, whereas H5- index is 54. The field-weighted citation impact is 1.31, meaning that our publications have been cited 31% more than would be expected based on the world average for similar publications. The map above demonstrates the collaboration between NU and other institutions across the

globe based on co-authored publications over the period from 2017 to 2022. There are 3,667 NU research papers published in collaboration with international institutions, which accounts for 68.3% of the total number of publications produced by our University with the overall Field-Weighted Citation Impact of 1.40. For getting more comprehensive information on the research performance at NU, please have a look at the following [presentation](#) prepared using SciVal research evaluation platform. If you have any questions regarding the provided information, please contact Saule Sadykova (ssadykova@nu.edu.kz)

FUNDING OPPORTUNITIES

#	<u>Opportunity</u>	<u>Funder</u>	<u>Deadline</u>	<u>Source link</u>
1	The Translational Research Program	The Leukemia & Lymphoma Society of Canada	28-Oct-22	URL
2	International Development and Education Award (IDEA)	American Society of Clinical Oncology	31-Oct-22	URL
3	MDA Research Grants	Muscular Dystrophy Association	31-Oct-22	URL
4	Small-scale experiments in fundamental physics	The Alfred P. Sloan Foundation, the Gordon and Betty Moore Foundation, the John Templeton Foundation, and the Simons Foundation	31-Oct-22	URL
5	Early Career Awards (pediatrics worldwide)	Thrasher Research Fund	4-Nov-22	URL
6	The Research-Practice Partnership (RPP) Grants Program	The Ford Foundation	9-Nov-22	URL
7	Advanced Clinical Research Award	American Society of Clinical Oncology	14-Nov-22	URL
8	The Abney Foundation`s grants	The Abney Foundation	15-Nov-22	URL
9	General Research Grants: Scholarships	Gerda Henkel Foundation	24-Nov-22	URL
10	INNOVATIONS IN IBD RESEARCH	Crohn's and Colitis Canada	30-Nov-22	URL
11	Path to a Cure – Research Grants (cystic fibrosis worldwide)	Cystic Fibrosis Foundation	1-Dec-22	URL
12	Research grants in ornithology	The Ornithological Society of the Middle East (OSME) THE TREVOR POYSER SPECIES CONSERVATION FUND	1-Dec-22	URL
13	Macular Degeneration Research Program	BrightFocus foundation	5-Dec-22	URL
14	Macular Degeneration Research Program (established investigators worldwide)	BrightFocus Foundation	5-Dec-22	URL
15	Macular Degeneration Research Program (new investigators worldwide)	BrightFocus Foundation	5-Dec-22	URL
16	FRANCIS S. COLLINS SCHOLARS PROGRAM IN NEUROFIBROMATOSIS CLINICAL AND TRANSLATIONAL RESEARCH	Neurofibromatosis Therapeutic Acceleration Program (NTAP)	9-Dec-22	URL
17	Grants in natural resources protection, food, public health	The Conservation, Food and Health Foundation	1-Jan-23	URL
18	A Collaborative Pediatric Cancer Research Awards Program	Rally Foundation for Childhood Cancer Research, Arms Wide Open Childhood Cancer Foundation, Kids Join The Fight, The Truth 365 and Infinite Love for Kids Fighting Cancer	6-Jan-23	URL
19	Inclusive Health Research	`Nature` with sponsorship by Takeda	6-Jan-23	URL
20	The Large Research Grants on Education Program	The Ford Foundation	12-Jan-23	URL

FUNDING OPPORTUNITIES

#	<u>Opportunity</u>	<u>Funder</u>	<u>Deadline</u>	<u>Source link</u>
<u>21</u>	More than Skin Deep: Mental Health Grant	The National Psoriasis Foundation (NPF)	15-Jan-23	<u>URL</u>
<u>22</u>	2022-2023 INTERNATIONAL NETWORKS OF EXCELLENCE PROGRAM	The Leducq Foundation	14-Feb-23	<u>URL</u>
<u>23</u>	Researching Research - "Collaborative Projects"	Volkswagen Foundation	15-Feb-23	<u>URL</u>
<u>24</u>	Brain Global Neurology (UK neurology)		20-Feb-23	<u>URL</u>
<u>25</u>	Clinical Research Award	The Cystic Fibrosis Foundation	1-Mar-23	<u>URL</u>
<u>26</u>	Funding Programme Lost Cities (humanities worldwide)	Gerda Henkel Foundation	24-May-23	<u>URL</u>
<u>27</u>	Discovery Grants	National Psoriasis Foundation	15-Oct-23	<u>URL</u>
<u>28</u>	Translational Research Grants	National Psoriasis Foundation	15-Oct-23	<u>URL</u>

New research publications indexed by Scopus (count: 268 as of October 4)

- Abdulla, K. (2022). New evidence on the role of human capital in economic development. *Applied Economics*, doi:10.1080/00036846.2022.2095348
- Abduvalov, A., Kaikanov, M., Atabaev, T. S., & Tikhonov, A. (2022). Improving photoelectrochemical activity of magnetron-sputtered double-layer tungsten trioxide photoanodes by irradiation with intense pulsed ion beams. *Nanomaterials*, 12(15) doi:10.3390/nano12152639
- Abedinia, O., Ghasemi-Marzbali, A., Nurmanova, V., & Bagheri, M. (2022). A new reconfigured electricity market bidding strategy in view of players' concerns. *IEEE Transactions on Industry Applications*, , 1-11. doi:10.1109/TIA.2022.3200348
- Abedinia, O., Ghasemi-Marzbali, A., Shafiei, M., & Bagheri, M. (2022). A modified salp swarm algorithm: An application for reactive power dispatch problem. Paper presented at the 2022 IEEE International Conference on Environment and Electrical Engineering and 2022 IEEE Industrial and Commercial Power Systems Europe, IEEEIC / I and CPS Europe 2022, doi:10.1109/IEEEIC/ICPSEurope54979.2022.9854756 Retrieved from www.scopus.com
- Abedinia, O., Ghasemi-Marzbali, A., Shafiei, M., Sobhani, B., Gharehpetian, G. B., & Bagheri, M. (2022). A multi-level model for hybrid short term wind forecasting based on SVM, wavelet transform and feature selection. Paper presented at the 2022 IEEE International Conference on Environment and Electrical Engineering and 2022 IEEE Industrial and Commercial Power Systems Europe, IEEEIC / I and CPS Europe 2022, doi:10.1109/IEEEIC/ICPSEurope54979.2022.9854519 Retrieved from www.scopus.com
- Abibullaev, B., Kunanbayev, K., & Zollanvari, A. (2022). Subject-independent classification of P300 event-related potentials using a small number of training subjects. *IEEE Transactions on Human-Machine Systems*, , 1-12. doi:10.1109/THMS.2022.3189576
- Abilassan, A., Restrepo, J. E., & Suragan, D. (2022). On a variant of multivariate mittag-leffler's function arising in the laplace transform method. *Integral Transforms and Special Functions*, doi:10.1080/10652469.2022.2111420
- Abuov, Y., Serik, G., & Lee, W. (2022). Techno-economic assessment and life cycle assessment of CO₂-EOR. *Environmental Science and Technology*, 56(12), 8571-8580. doi:10.1021/acs.est.1c06834
- Adhikari, B., King, J., & Santoso, L. P. (2022). A BIT of help? the divergent effect of bilateral investment treaties on women's rights. *Journal of Human Rights*, 21(4), 419-433. doi:10.1080/14754835.2021.2004886
- Adilkhanov, A., Rubagotti, M., & Kappassov, Z. (2022). Haptic devices: Wearability-based taxonomy and literature review. *IEEE Access*, 10, 91923-91947. doi:10.1109/ACCESS.2022.3202986
- Adolfo, C. S., Albougami, A. S. B., Roque, M. Y., Aruta, J. J. B. R., & Almazan, J. U. (2022). An integrative review of negative emotions of older adults in later life. *Nursing Forum*, doi:10.1111/nuf.12785
- Adolfo, C. S., Almazan, J. U., Cruz, J. P., Albougami, A. S. B., Roque, M. Y., & Montayre, J. (2022). Saudi arabian nurses' workaholic tendencies and their predictive role in professional quality of life. *Perspectives in Psychiatric Care*, 58(3), 1144-1152. doi:10.1111/ppc.12913
- Adotey, E. K., Burkutova, L., Tastanova, L., Bekeshev, A., Balanay, M. P., Sabanov, S., . . . Amouei Torkmahalleh, M. (2022). Quantification and the sources identification of total and insoluble hexavalent chromium in ambient PM: A case study of aktobe, kazakhstan. *Chemosphere*, 307 doi:10.1016/j.chemosphere.2022.136057
- Afzal Tajik, M., Shamatov, D., & Phillipova, L. (2022). Stakeholders' perceptions of the quality of education in rural schools in kazakhstan. *Improving Schools*, 25(2), 187-204. doi:10.1177/13654802211031088
- Ahmed, M. A., Nazim, F., Ahmed, K., Bari, M. F., Abdulwahed, A., AlMokhatieb, A. A., . . . Abidi, S. H. (2022). Association between the baseline gene expression profile in periapical granuloma and periapical wound healing after surgical endodontic treatment. *Scientific Reports*, 12(1) doi:10.1038/s41598-022-17774-z
- Ahmed, T., Mohammed, Q., Subeshan, B., Rahman, M., Nuraje, N., & Asmatulu, E. (2022). Improving flame retardancy and hydrophobicity of fabrics via graphene inclusion obtained from recycled batteries. *Materials Today: Proceedings*, doi:10.1016/j.matpr.2022.07.469
- Ahn, C. -, Park, D., & Moon, S. -. (2022). Analysis of surface settlement troughs induced by twin shield tunnels in soil: A case study. *Geomechanics and Engineering*, 30(4), 325-336. doi:10.12989/gae.2022.30.4.325

New research publications indexed by Scopus (count: 268 as of October 4)

- Aimaganbetov, K., Almas, N., Kurbanova, B., Muratov, D., Serikkanov, A., Insepov, Z., & Tokmoldin, N. (2022). Electrical and structural characterization of few-layer graphene sheets on quartz. *Materials*, 15(15) doi:10.3390/ma15155330
- Aitkulova, A., Mukhtarova, K., Zholdybayeva, E., Medetov, Y., Dzhamantayeva, B., Kassymbek, K., . . . Ramankulov, Y. (2022). Activated leukocyte cell adhesion molecule/cluster of differentiation 166 rs10933819 (G>A) variant is associated with familial intracranial aneurysms. *Biomedical Reports*, 17(2) doi:10.3892/br.2022.1548
- Akemu, O., & Subramanian, V. (2022). IB research opportunities in central asia doi:10.1007/978-3-031-06003-8_5 Retrieved from www.scopus.com
- Akhmadi, S., & Tsakalerou, M. (2022). Removing the barriers to innovation: Firm size matters! Paper presented at the 2022 IEEE Technology and Engineering Management Conference: Societal Challenges: Technology, Transitions and Resilience Virtual Conference, TEMSCON EUROPE 2022, 26-31. doi:10.1109/TEMSCONEUROPE54743.2022.9802052 Retrieved from www.scopus.com
- Alamooti, A., Colombano, S., Omirbekov, S., Ahmadi, A., Lion, F., & Davarzani, H. (2022). Influence of the injection of densified polymer suspension on the efficiency of DNAPL displacement in contaminated saturated soils. *Journal of Hazardous Materials*, 440 doi:10.1016/j.jhazmat.2022.129702
- Al-Awadi, A. M., Babi, A., Finan, R. R., Atageldiyeva, K., Shaimardanova, M., Mustafa, F. E., . . . Almawi, W. Y. (2022). ADIPOQ gene polymorphisms and haplotypes linked to altered susceptibility to PCOS: A case–control study. *Reproductive BioMedicine Online*, doi:10.1016/j.rbmo.2022.06.009
- Alina, D., Shomanov, A., & Baimukhametova, S. (2022). MaLeFiSenta: Machine learning for FilamentS identification and orientation in the ISM. *IEEE Access*, 10, 74472-74482. doi:10.1109/ACCESS.2022.3189646
- Almas, N., Kurbanova, B., Zhakiyev, N., Rakhadilov, B., Sagdoldina, Z., Andybayeva, G., . . . Insepov, Z. (2022). Mechano-chemical properties of electron beam irradiated polyetheretherketone. *Polymers*, 14(15) doi:10.3390/polym14153067
- Alrasheadi, B. A., Alamri, M. S., Aljohani, K. A., Al-Dossary, R., Albaqawi, H., Alharbi, J., . . . Almazan, J. U. (2022). Nurses' perception of safety culture in Medical–Surgical units in hospitals in saudi arabia. *Medicina (Lithuania)*, 58(7) doi:10.3390/medicina58070897
- Amirova, A., CohenMiller, A., & Sandygulova, A. (2022). The effects of the COVID-19 pandemic on the well-being of children with autism spectrum disorder: Parents' perspectives. *Frontiers in Psychiatry*, 13 doi:10.3389/fpsy.2022.913902
- Amiti, M., Itskhoki, O., & Konings, J. (2022). Dominant currencies: How firms choose currency invoicing and why it matters*. *Quarterly Journal of Economics*, 137(3), 1435-1493. doi:10.1093/qje/qjac004
- Andrews, U., Lempp, S., Mustafa, M., & Schweber, N. D. (2022). The first-order theory of the computably enumerable equivalence relations in the uncountable setting. *Journal of Logic and Computation*, 32(1), 98-114. doi:10.1093/logcom/exab045
- Ansatbayeva, T., Kaidarova, D., Kunirova, G., Khussainova, I., Rakhmetova, V., Smailova, D., . . . Izmailovich, M. (2022). Early integration of palliative care into oncological care: A focus on patient-important outcomes. *International Journal of Palliative Nursing*, 28(8), 366-375. doi:10.12968/ijpn.2022.28.8.366
- Arynov, Z. (2022). Educated into sinophilia? how kazakh Graduates/Students of chinese universities perceive china. *Journal of Current Chinese Affairs*, doi:10.1177/18681026221110245
- Arzykulov, S., Naurzybayev, G., Celik, A., & Eltawil, A. M. (2022). RIS-assisted full-duplex relay systems. *IEEE Systems Journal*, , 1-12. doi:10.1109/JSYST.2022.3189850
- Asadullah, G. M., Ali, H., Hashikura, K., Kamal, M. A. S., & Yamada, K. (2022). Development of an automatic air-driven 3D-printed spinal posture corrector. *Actuators*, 11(7) doi:10.3390/act11070184
- Asare, E. O., Mun, E. A., Marsili, E., & Paunov, V. N. (2022). Nanotechnologies for control of pathogenic microbial biofilms. *Journal of Materials Chemistry B*, 10(27), 5129-5153. doi:10.1039/d2tb00233g
- Ashimkhanova, A., Syssoyev, D., Gusmanov, A., Yesmembetov, K., Yespotayeva, A., Abbay, A., . . . Gaipov, A. (2022). Epidemiological characteristics of chronic viral hepatitis in kazakhstan: Data from unified nationwide electronic healthcare system 2014–2019. *Infection and Drug Resistance*, 15, 3333-3346. doi:10.2147/IDR.S363609

New research publications indexed by Scopus (count: 268 as of October 4)

- Asif, M., Wang, L., Hazlett, R., & Serikov, G. (2022). IAST modelling of competitive adsorption, diffusion and thermodynamics for CO₂-ECBM process. Paper presented at the Society of Petroleum Engineers - SPE EuropeEC - Europe Energy Conference Featured at the 83rd EAGE Annual Conference and Exhibition, EURO 2022, doi:10.2118/209636-MS Retrieved from www.scopus.com
- Avcu, E., Bastan, F. E., Guney, M., Yildiran Avcu, Y., Ur Rehman, M. A., & Boccaccini, A. R. (2022). Biodegradable polymer matrix composites containing graphene-related materials for antibacterial applications: A critical review. *Acta Biomaterialia*, doi:10.1016/j.actbio.2022.07.048
- Azhgaliyeva, D., Kapsalyamova, Z., & Mishra, R. (2022). Oil price shocks and green bonds: An empirical evidence. *Energy Economics*, 112 doi:10.1016/j.eneco.2022.106108
- Babalola, M. T., Bal, M., Cho, C. H., Garcia-Lorenzo, L., Guedhami, O., Liang, H., . . . van Gils, S. (2022). Bringing excitement to empirical business ethics research: Thoughts on the future of business ethics. *Journal of Business Ethics*, doi:10.1007/s10551-022-05242-7
- Baimukashev, D., Rakhim, B., Rubagotti, M., & Varol, H. A. (2022). End-to-end deep fault-tolerant control. *IEEE/ASME Transactions on Mechatronics*, 27(4), 2224-2234. doi:10.1109/TMECH.2021.3100150
- Baimukashev, D., Rzagaliyev, Y., Rubagotti, M., & Varol, H. A. (2022). Deep robust control of a mechatronic system with parametric uncertainties. Paper presented at the IEEE/ASME International Conference on Advanced Intelligent Mechatronics, AIM, , 2022-July 1031-1038. doi:10.1109/AIM52237.2022.9863362 Retrieved from www.scopus.com
- Bakhbergen, U., Shon, C. -, Zhang, D., Ryeol Kim, J., & Liu, J. (2022). Optimization of mixture parameter for physical and mechanical properties of reactive powder concrete under external sulfate attack using taguchi method. *Construction and Building Materials*, 352 doi:10.1016/j.conbuildmat.2022.129023
- Bang, J. -, Lee, M. -, Fazli, S., Guan, C., & Lee, S. -. (2022). Spatio-spectral feature representation for motor imagery classification using convolutional neural networks. *IEEE Transactions on Neural Networks and Learning Systems*, 33(7), 3038-3049. doi:10.1109/TNNLS.2020.3048385
- Baris, O. F., Knox, C., & Pelizzo, R. (2022). "Good enough" governance in the post-soviet eurasia. *Journal of Comparative Policy Analysis: Research and Practice*, 24(4), 329-359. doi:10.1080/13876988.2021.1893111
- Barteneva, N. S., Meir Khanova, A., Malashenkov, D., & Vorobjev, I. A. (2022). To die or not to Die—Regulated cell death and survival in cyanobacteria. *Microorganisms*, 10(8) doi:10.3390/microorganisms10081657
- Bayramov, E., Tessari, G., & Kada, M. (2022). Quantifying two-dimensional surface displacements using high-resolution cosmo-SkyMed, TerraSAR-X and medium-resolution sentinel-1 SAR interferometry: Case study for the tengiz oilfield. *Sensors*, 22(17) doi:10.3390/s22176416
- Bazhenov, N., & Mustafa, M. (2022). Computable embeddability for algebraic structures. *Asian-European Journal of Mathematics*, 15(7) doi:10.1142/S1793557122501261
- Belgibayeva, A., Rakhmatkyzy, M., Adi, A., & Taniguchi, I. (2022). Synthesis of free-standing Co₃(PO₄)₂/C composite nanofiber mats and their characteristics as multi-functional interlayers for lithium-sulfur batteries. *ChemElectroChem*, 9(17) doi:10.1002/celec.202200458
- Benassi, E., Vaganova, T., Malykhin, E., Gatilov, Y., Nurtay, L., & Fan, H. (2022). Intermolecular interactions in the crystalline structure of some polyhalogenated di- and triamino pyridines: Spectroscopical perspectives. *Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy*, 281 doi:10.1016/j.saa.2022.121632
- Bilal, R., Ospanov, M., Dzhenalayev, D., Olkhovik, Y., Khamitov, M., Kozhakhmetov, A., . . . Abetova, D. (2022). The technique of mobilization of the colon for pull-through procedure in Hirschsprung's disease. *Frontiers in Surgery*, 9 doi:10.3389/fsurg.2022.921789
- Bjørklund, G., Antonyak, H., Polishchuk, A., Semenova, Y., Lesiv, M., Lysiuk, R., & Peana, M. (2022). Effect of methylmercury on fetal neurobehavioral development: An overview of the possible mechanisms of toxicity and the neuroprotective effect of phytochemicals. *Archives of Toxicology*, doi:10.1007/s00204-022-03366-3
- Boshkayev, K., Konysbayev, T., Kurmanov, Y., Luongo, O., & Malafarina, D. (2022). Accretion disk luminosity for black holes surrounded by dark matter with tangential pressure. *Astrophysical Journal*, 936(2) doi:10.3847/1538-4357/ac8804

New research publications indexed by Scopus (count: 268 as of October 4)

- Bou-Hamdan, K. F., & Abbas, A. H. (2022). Utilizing ultrasonic waves in the investigation of contact stresses, areas, and embedment of spheres in manufactured materials replicating proppants and brittle rocks. *Arabian Journal for Science and Engineering*, 47(9), 11635-11650. doi:10.1007/s13369-021-06409-6
- Bozzini, G., Maltagliati, M., Berti, L., Vismara, R., Sanguedolce, F., Crisci, A., . . . Liatsikos, E. (2022). Development and validation of a novel skills training model for PCNL, an ESUT project. *Acta Biomedica*, 93(4) doi:10.23750/abm.v93i4.11821
- Bray, M., & Hajar, A. (2022). Shadow education in the middle east: Private supplementary tutoring and its policy implications. *Shadow education in the middle east: Private supplementary tutoring and its policy implications* (pp. 1-122) doi:10.4324/9781003317593 Retrieved from www.scopus.com
- Castro, A. J., Jabbarkhanov, K., & Zhapsarbayeva, L. (2022). The nonlinear Schrödinger–Airy equation in weighted sobolev spaces. *Nonlinear Analysis, Theory, Methods and Applications*, 223 doi:10.1016/j.na.2022.113068
- Chertov, N., Nechaeva, Y., Zhulanov, A., Pystogova, N., Danilova, M., Boronnikova, S., & Kalendar, R. (2022). Genetic structure of pinus populations in the urals. *Forests*, 13(8) doi:10.3390/f13081278
- Courtney, M., Costley, J., Baldwin, M., Lee, K., & Fanguy, M. (2022). Individual versus collaborative note-taking: Results of a quasi-experimental study on student note completeness, test performance, and academic writing. *Internet and Higher Education*, 55 doi:10.1016/j.iheduc.2022.100873
- Courtney, M., Karakus, M., Ersozlu, Z., & Nurumov, K. (2022). The influence of ict use and related attitudes on students' math and science performance: Multilevel analyses of the last decade's pisa surveys. *Large-Scale Assessments in Education*, 10(1) doi:10.1186/s40536-022-00128-6
- Courtney, M. G. R., Rakhymbayeva, Z., Shilibekova, A., Ziyedenova, D., Soltangazina, S., Muratkyzy, A., . . . Olzhayeva, A. (2022). Kazakh, russian, and uyghur child language literacy: The role of the updated curriculum on longitudinal growth trajectories in kazakhstan. *Studies in Educational Evaluation*, 75 doi:10.1016/j.stueduc.2022.101189
- Cruz, J. P., Balay-odao, E. M., Bajet, J. B., Alsharari, A. F., Tork, H. M. M., Alharbi, T. A. F., & Almazan, J. U. (2022). Testing the validity and reliability of the arabic version of the disaster response self-efficacy scale among saudi nursing students. *Nurse Education in Practice*, 64 doi:10.1016/j.nepr.2022.103443
- Cui, X., Guo, J., Araby, S., Abbassi, F., Zhang, C., Diaby, A. L., & Meng, Q. (2022). Porous polyvinyl alcohol/graphene oxide composite film for strain sensing and energy-storage applications. *Nanotechnology*, 33(41) doi:10.1088/1361-6528/ac7b35
- Da Wan, C., Kuzhabekova, A., & Ispambetova, B. (2022). Malaysian PhD graduates coming home: Adjustment and adaptation to the research ecosystem. *Journal of Higher Education Policy and Management*, doi:10.1080/1360080X.2022.2098450
- Dávila, J. (2022). Bequests or education. *Economic Theory*, doi:10.1007/s00199-022-01436-2
- Dawood, A., Shah, M., Ahmad, J., Ali, S., Ullah, S., & Asghar, Z. (2022). Metal oxide-carbon composites and their applications in optoelectronics and electrochemical energy devices. *Metal oxide-carbon hybrid materials: Synthesis, properties and applications* (pp. 309-339) doi:10.1016/B978-0-12-822694-0.00007-7 Retrieved from www.scopus.com
- Demeter, T., Parent, T., & Toon, A. (2022). Mental fictionalism: Philosophical explorations. *Mental fictionalism: Philosophical explorations* (pp. 1-370) doi:10.4324/9781003091073 Retrieved from www.scopus.com
- Demeter, T., Parent, T., & Toon, A. (2022). What is mental fictionalism? *Mental fictionalism: Philosophical explorations* (pp. 1-24) doi:10.4324/9781003091073-1 Retrieved from www.scopus.com
- Denissenya, M., & Linder, E. V. (2022). Deep learning unresolved lensed light curves. *Monthly Notices of the Royal Astronomical Society*, 515(1), 977-983. doi:10.1093/mnras/stac1726
- Dolzhikova, I., Abibullaev, B., Sameni, R., & Zollanvari, A. (2022). Subject-independent classification of motor imagery tasks in EEG using multisubject ensemble CNN. *IEEE Access*, 10, 81355-81363. doi:10.1109/ACCESS.2022.3195513
- Dossybayeva, K., Bexeitov, Y., Mukusheva, Z., Almukhamedova, Z., Assylbekova, M., Abdukhakimova, D., . . . Poddighe, D. (2022). Analysis of peripheral blood basophils in pediatric systemic lupus erythematosus. *Diagnostics*, 12(7) doi:10.3390/diagnostics12071701
- Eghtesadi, N., Olaifa, K., Perna, F. M., Capriati, V., Trotta, M., Ajunwa, O., & Marsili, E. (2022). Electroactivity of weak electricigen bacillus subtilis biofilms in solution containing deep eutectic solvent components. *Bioelectrochemistry*, 147 doi:10.1016/j.bioelechem.2022.108207

New research publications indexed by Scopus (count: 268 as of October 4)

- Em, S., Yedigenov, M., Khamkhash, L., Atabaev, S., Molkenova, A., Pouloupoulos, S. G., & Atabaev, T. S. (2022). Uncovering the role of surface-attached ag nanoparticles in photodegradation improvement of rhodamine B by ZnO-ag nanorods. *Nanomaterials*, 12(16) doi:10.3390/nano12162882
- Fang, C., Bai, Y., Chen, H., Ukaegbu, I. A., Nakarmi, B., & Pan, S. (2022). Generation of random-hopped LFM signal based on optical injection in a DFB laser. Paper presented at the Proceedings of SPIE - the International Society for Optical Engineering, , 12278 doi:10.1117/12.2615621 Retrieved from www.scopus.com
- Fang, C., Shrestha, V. R., Ukaegbu, I. A., Ren, G., Nakarmi, B., & Pan, S. (2022). A grating-assisted microring resonator for wideband filtering. Paper presented at the Proceedings of SPIE - the International Society for Optical Engineering, , 12283 doi:10.1117/12.2618747 Retrieved from www.scopus.com
- Fernandez, A., Restrepo, J. E., & Suragan, D. (2022). On linear fractional differential equations with variable coefficients. *Applied Mathematics and Computation*, 432 doi:10.1016/j.amc.2022.127370
- Fernandez, A., Restrepo, J. E., & Suragan, D. (2022). PRABHAKAR-TYPE LINEAR DIFFERENTIAL EQUATIONS WITH VARIABLE COEFFICIENTS. *Differential and Integral Equations*, 35(9-10), 581-610. Retrieved from www.scopus.com
- Ferring, R., Oms, O., Nomade, S., Humphrey, J. D., Tappen, M., Coil, R., . . . Lordkipanidze, D. (2022). Early pleistocene stratigraphy, sedimentary environments, and formation contexts at dmanisi in the georgian caucasus. *Journal of Human Evolution*, 172 doi:10.1016/j.jhevol.2022.103254
- Filby, B. W., Weldrick, P. J., & Paunov, V. N. (2022). Overcoming beta-lactamase-based antimicrobial resistance by nanocarrier-loaded clavulanic acid and antibiotic cotreatments. *ACS Applied Bio Materials*, 5(8), 3826-3840. doi:10.1021/acsabm.2c00369
- Gao, C. H., & Li, W. (2022). Lessons learned from a carbon dioxide huff and puff field test in a tight reservoir. *Greenhouse Gases: Science and Technology*, doi:10.1002/ghg.2180
- Gapanenok, D., Makhmet, A., Peshkov, A. A., Smirnova, D., Amire, N., Peshkov, V. A., . . . Krasavin, M. (2022). Multicomponent assembly of trisubstituted imidazoles and their photochemical cyclization into fused polyheterocyclic scaffolds. *Journal of Organic Chemistry*, 87(12), 7838-7851. doi:10.1021/acs.joc.2c00475
- Ghasemi, M., & Shafiei, A. (2022). Influence of brine compositions on wetting preference of montmorillonite in rock/brine/oil system: An in silico study. *Applied Surface Science*, 606 doi:10.1016/j.apsusc.2022.154882
- Giannakopoulos, S., Frontistis, Z., Vakros, J., Pouloupoulos, S. G., Manariotis, I. D., & Mantzavinos, D. (2022). Combined activation of persulfate by biochars and artificial light for the degradation of sulfamethoxazole in aqueous matrices. *Journal of the Taiwan Institute of Chemical Engineers*, 136 doi:10.1016/j.jtice.2022.104440
- Goodman, B., & Kambatyrova, A. (2022). Both necessary and irrelevant: Political economy and linguistic injustice of english in higher education in kazakhstan. *International Journal of the Sociology of Language*, 2022(277), 77-94. doi:10.1515/ijsl-2021-0074
- Goodman, B., Kambatyrova, A., Aitzhanova, K., Kerimkulova, S., & Chsherbakov, A. (2022). Institutional supports for language development through english-medium instruction: A factor analysis. *TESOL Quarterly*, 56(2), 713-749. doi:10.1002/tesq.3090
- Goyal, T., Hussain, S., Martinez-Marroquin, E., Brown, N. A. T., & Jamwal, P. K. (2022). Impedance control of a wrist rehabilitation robot based on autodidact stiffness learning. *IEEE Transactions on Medical Robotics and Bionics*, 4(3), 796-806. doi:10.1109/TMRB.2022.3194528
- Gudun, K. A., Tussupbayev, S., Slamova, A., & Khalimon, A. Y. (2022). Hydroboration of isocyanates: Cobalt-catalyzed vs. catalyst-free approaches. *Organic and Biomolecular Chemistry*, 20(34), 6821-6830. doi:10.1039/d2ob01192a
- Ha, H., Raghavan, A., & Demircioglu, M. A. (2022). COVID-19 and employee productivity in the public sector. *Asia Pacific Journal of Public Administration*, doi:10.1080/23276665.2022.2104737
- Habib, N., Buzzaccarini, G., Centini, G., Moawad, G. N., Ceccaldi, P. -, Gitas, G., . . . Sleiman, Z. (2022). Impact of lifestyle and diet on endometriosis: A fresh look to a busy corner. *Przeglad Menopauzalny*, 21(2), 124-132. doi:10.5114/pm.2022.116437
- Hajar, A., & Manan, S. A. (2022). Emergency remote english language teaching and learning: Voices of primary school students and teachers in kazakhstan. *Review of Education*, 10(2) doi:10.1002/rev3.3358

New research publications indexed by Scopus (count: 268 as of October 4)

- Hamdany, A. H., Satyanaga, A., Zhang, D., Kim, Y., & Kim, J. R. (2022). Photocatalytic cementitious material for eco-efficient Construction—A systematic literature review. *Applied Sciences* (Switzerland), 12(17) doi:10.3390/app12178741
- Hamed Mashhadzadeh, A., Zarghami Dehaghani, M., Molaie, F., Fooladapanjeh, S., Farzadian, O., & Spitas, C. (2022). A theoretical insight into the mechanical properties and phonon thermal conductivity of biphenylene network structure. *Computational Materials Science*, 214 doi:10.1016/j.commatsci.2022.111761
- Haruna, U. A., Amos, O. A., Dara, O. O., Wuraola, S. F., Kilonzo, J. S., Olorunfemi, O. E., . . . Lucero-Prisno, D. E. (2022). Agriculture and food security in northern nigeria, part I: The impact of mining doi:10.1016/bs.af2s.2022.07.002 Retrieved from www.scopus.com
- Hazlett, R. D., & Younis, R. (2022). Multiscale matrix-fracture transfer functions for naturally fractured reservoirs using an analytical, infinite conductivity, discrete fracture model. *Computational Geosciences*, 26(4), 1011-1028. doi:10.1007/s10596-021-10109-3
- Hwami, M. (2022). A comparative scoping review of the impact of international economic sanctions on education. *Compare*, 52(6), 949-965. doi:10.1080/03057925.2020.1846120
- Hwami, M. (2022). Education under siege: Exploring how international economic sanctions create crises of pedagogy. *ECNU Review of Education*, 5(3), 450-469. doi:10.1177/2096531120950330
- Hwami, M. (2022). The zimbabwean university under authoritarian neoliberalism. *Interchange*, doi:10.1007/s10780-022-09470-8
- Ibrayev, T., Li, M., Bakbergenov, N., Panenka, P., & Batyrbayeva, A. (2022). PROBLEMS OF THE USE OF WATER RESOURCES AND THE WAYS OF THEIR SOLUTION IN KAZAKHSTAN. *News of the National Academy of Sciences of the Republic of Kazakhstan, Series of Geology and Technical Sciences*, 2022(4), 69-80. doi:10.32014/2022.2518-170X.201
- Issabekova, A., Zhunussova, M., Zhumabekova, M., Bari, A., Adilbayeva, A., & Ogay, V. (2022). Comparable analysis of mature antigen-loaded dendritic cells preparation methods for cytokine-induced killer cells activation in vitro. *Journal of Applied Biotechnology Reports*, 9(2), 596-602. doi:10.30491/jabr.2021.282789.1375
- Issakhov, M., Shakeel, M., Pourafshary, P., Aidarova, S., & Sharipova, A. (2022). Hybrid surfactant-nanoparticles assisted CO2 foam flooding for improved foam stability: A review of principles and applications. *Petroleum Research*, 7(2), 186-203. doi:10.1016/j.ptlrs.2021.10.004
- Ja'afaru, M. I., Abbas, T., Ajunwa, O. M., & Olaifa, K. (2022). Characterization and statistical optimization of biosurfactant production using bacillus subtilis isolated from automotive oil-contaminated soil in yola, nigeria. *Scientific African*, 17 doi:10.1016/j.sciaf.2022.e01357
- Jetybayeva, A., Uzakbaiuly, B., Mukanova, A., Nurpeissova, A., & Bakenov, Z. (2022). Solid-state nanobatteries doi:10.1021/bk-2022-1414.ch010 Retrieved from www.scopus.com
- Kadyrova, I., Yegorov, S., Negmetzhanov, B., Kolesnikova, Y., Kolesnichenko, S., Korshukov, I., . . . Babenko, D. (2022). High SARS-CoV-2 seroprevalence in karaganda, kazakhstan before the launch of COVID-19 vaccination. *PLoS ONE*, 17(7 July) doi:10.1371/journal.pone.0272008
- Kairov, U., Amanzhanova, A., Karabayev, D., Rakhimova, S., Aitkulova, A., Samatkyzy, D., . . . Akilzhanova, A. (2022). A high scale SARS-CoV-2 profiling by its whole-genome sequencing using oxford nanopore technology in kazakhstan. *Frontiers in Genetics*, 13 doi:10.3389/fgene.2022.906318
- Kairov, U., Molkenov, A., Sharip, A., Rakhimova, S., Seidualy, M., Rhie, A., . . . Akilzhanova, A. (2022). Whole-genome sequencing and genomic variant analysis of kazakh individuals. *Frontiers in Genetics*, 13 doi:10.3389/fgene.2022.902804
- Kaiyrlykyzy, A., Kozhakhmetov, S., Babenko, D., Zholdasbekova, G., Alzhanova, D., Olzhayev, F., . . . Askarova, S. (2022). Study of gut microbiota alterations in alzheimer's dementia patients from kazakhstan. *Scientific Reports*, 12(1), 15115. doi:10.1038/s41598-022-19393-0
- Kakimov, A. G., Yerlanuly, Y., Akhanuly, A., Dossayev, I. T., Shalenov, E. O., Sadirkhanov, Z. T., . . . Jumabekov, A. N. (2022). Passivation of perovskite layer surface states with pyridine in flexible and printed perovskite solar cells. *Flexible and Printed Electronics*, 7(3) doi:10.1088/2058-8585/ac8753
- Kali, A., Gusmanov, A., Aripov, M., & Chan, M. -. (2022). Proposing new body mass index and waist circumference cut-offs based on cardiometabolic risks for a central asia population: A feasibility study. *Frontiers in Endocrinology*, 13 doi:10.3389/fendo.2022.963352
- Kamalov, B., Batay, S., Zhangaskhanov, D., Zhao, Y., & Ng, E. Y. K. (2022). Arbitrary hybrid turbulence modeling approach for high-fidelity NREL phase VI wind turbine CFD simulation. *Fluids*, 7(7) doi:10.3390/fluids7070236

New research publications indexed by Scopus (count: 268 as of October 4)

- Kanabekova, P., Dautletkanov, B., Kadyrova, A., Akhmetova, A., & Kulsharova, G. (2022). Development of a microfluidic device and nanofiber membranes for emulating air-blood barrier in lung-on-a-chip devices. Paper presented at the 17th IEEE International Conference on Nano/Micro Engineered and Molecular Systems, NEMS 2022, 124-128. doi:10.1109/NEMS54180.2022.9791186 Retrieved from www.scopus.com
- Karabay, A., Utemuratova, R., Zhang, D., & Varol, H. A. (2022). CARBON FOOTPRINT OPTIMIZED DESIGN OF SUSTAINABLE REINFORCED CONCRETE COLUMNS USING DEEP LEARNING. Paper presented at the Proceedings of International Structural Engineering and Construction, , 9(1) SUS-14-1-SUS-14-6. doi:10.14455/ISEC.2022.9(1).SUS-14 Retrieved from www.scopus.com
- Karakus, M., Courtney, M., & Aydin, H. (2022). Correction to: Understanding the academic achievement of the first- and second-generation immigrant students: A multi-level analysis of PISA 2018 data (educational assessment, evaluation and accountability, (2022), 10.1007/s11092-022-09395-x). Educational Assessment, Evaluation and Accountability, doi:10.1007/s11092-022-09399-7
- Kassymov, A., Ruzhansky, M., & Suragan, D. (2022). Anisotropic fractional gagliardo-nirenberg, weighted caffarelli-kohn-nirenberg and lyapunov-type inequalities, and applications to riesz potentials and p-sub-laplacian systems. Potential Analysis, doi:10.1007/s11118-022-10029-6
- Kassymov, A., Ruzhansky, M., & Suragan, D. (2022). Reverse Stein–Weiss, Hardy–Littlewood–Sobolev, hardy, sobolev and Caffarelli–Kohn–Nirenberg inequalities on homogeneous groups. Forum Mathematicum, 34(5), 1147-1158. doi:10.1515/forum-2021-0110
- Kaupbayeva, B., Murata, H., Rule, G. S., Matyjaszewski, K., & Russell, A. J. (2022). Rational control of protein-protein interactions with protein-ATRP-generated protease-sensitive polymer cages. Biomacromolecules, 23(9), 3831-3846. doi:10.1021/acs.biomac.2c00679
- Khan, M., Abid Siddiqui, M., & Malone, K. L. (2022). Scientific attitudes: Gender differences, impact on physics scores and choices to study physics at higher levels among pre-college STEM students. International Journal of Science Education, doi:10.1080/09500693.2022.2097331
- Khan, N., Baláž, M., Burkitbayev, M., Tatykayev, B., Shalabayev, Z., Nemkayeva, R., . . . Urakaev, F. (2022). DMSO- mediated solvothermal synthesis of S/AgX (X = cl, br) microstructures and study of their photocatalytic and biological activity. Applied Surface Science, 601 doi:10.1016/j.apsusc.2022.154122
- Kiani, M. S., Sadirkhanov, Z. T., Kakimov, A. G., Parkhomenko, H. P., Ng, A., & Jumabekov, A. N. (2022). Solution-processed SnO₂ quantum dots for the electron transport layer of flexible and printed perovskite solar cells. Nanomaterials, 12(15) doi:10.3390/nano12152615
- Kim, I. K., & Nora, V. (2022). Buyer power and information sharing. Seoul Journal of Economics, 35(3), 261-290. doi:10.22904/sje.2022.35.3.003
- Kim, Y. S., Potashnikova, D. M., Gisina, A. M., Kholodenko, I. V., Kopylov, A. T., Tikhonova, O. V., . . . Lupatov, A. Y. (2022). TRIM28 is a novel regulator of CD133 expression associated with cancer stem cell phenotype. International Journal of Molecular Sciences, 23(17) doi:10.3390/ijms23179874
- Konings, J., Sagyndykova, G., Subramanian, V., & Volckaert, A. (2022). The granular nature of emerging market economies: The case of kazakhstan. Economics of Transition and Institutional Change, doi:10.1111/ecot.12346
- Korganbayev, S., De Landro, M., Wolf, A., Tosi, D., & Saccomandi, P. (2022). Tilted fiber bragg grating measurements during laser ablation of hepatic tissues: Quasi-distributed temperature reconstruction and cladding mode resonances analysis. IEEE Sensors Journal, 22(16), 15999-16007. doi:10.1109/JSEN.2022.3189153
- Korigov, S., Adoko, A. C., & Sengani, F. (2022). Unplanned dilution prediction in open stope mining: Developing new design charts using artificial neural network classifier. Journal of Sustainable Mining, 21(2), 157-168. doi:10.46873/2300-3960.1356
- Kozhakhmetova, A., Aidossov, S., Kapassova, A., & Borsoldayeva, K. (2022). Current knowledge and “myths” about celiac disease among physicians in the republic of kazakhstan: A countrywide cross-sectional study. Frontiers in Public Health, 10 doi:10.3389/fpubh.2022.956135
- Kozlov, M., Tulendinova, A., Kim, J., Ellis, G., & Skrzypacz, P. (2022). Oscillations of retaining wall subject to Grob’s swelling pressure. Scientific Reports, 12(1) doi:10.1038/s41598-022-15591-y
- Krstić, V. (2022). On the connection between lying, asserting, and intending to cause beliefs. Inquiry (United Kingdom), doi:10.1080/0020174X.2022.2111344
- Krstić, V., & Wiegmann, A. (2022). Bald-faced lies, blushing, and noses that grow: An experimental analysis. Erkenntnis, doi:10.1007/s10670-022-00541-x

New research publications indexed by Scopus (count: 268 as of October 4)

- Kudaibergenova, R., Ualibek, O., Sugurbekov, E., Demeuova, G., Frochot, C., Acherar, S., & Sugurbekova, G. (2022). Reduced graphene oxide-based superhydrophobic magnetic nanomaterial as high selective and recyclable sorbent for oil/organic solvent wastewater treatment. *International Journal of Environmental Science and Technology*, 19(9), 8491-8506. doi:10.1007/s13762-021-03722-3
- Kudaibergenova, Z., Toibekkyzy, A., Dautov, K., Chaudhary, M. A., & Hashmi, M. (2022). Employment of planar coil and DGS based resonators for hybrid WPT system realization. Paper presented at the Midwest Symposium on Circuits and Systems, , 2022-August doi:10.1109/MWSCAS54063.2022.9859298 Retrieved from www.scopus.com
- Kukhar, Y., Smagulova, A., & Kiyan, V. (2022). Generalized dermatophytosis of combined etiology in a circus tiger (*panthera tigris altaica*). *International Journal of Veterinary Science*, 11(4), 552-556. doi:10.47278/journal.ijvs/2022.159
- Kussainova, A., Kassym, L., Bekenova, N., Akhmetova, A., Glushkova, N., Kussainov, A., . . . Semenova, Y. (2022). Gene polymorphisms and serum levels of BDNF and CRH in vitiligo patients. *PLoS ONE*, 17(7 July) doi:10.1371/journal.pone.0271719
- Kuzdeuov, A., Aubakirova, D., Koishigarina, D., & Varol, H. A. (2022). TFW: Annotated thermal faces in the wild dataset. *IEEE Transactions on Information Forensics and Security*, 17, 2084-2094. doi:10.1109/TIFS.2022.3177949
- Kuzhabekova, A., Ispambetova, B., Baigazina, A., & Sparks, J. (2022). A critical perspective on short-term international mobility of faculty: An experience from kazakhstan. *Journal of Studies in International Education*, 26(4), 454-471. doi:10.1177/10283153211016270
- la Fleur, P., Baizhaxynova, A., Reynen, E., Kaunelis, D., & Galiyeva, D. (2022). Actovegin in the management of patients after ischemic stroke: A systematic review. *PLoS ONE*, 17(6 June) doi:10.1371/journal.pone.0270497
- Leitão, C., Pereira, S. O., Marques, C., Cennamo, N., Zeni, L., Shaimerdenova, M., . . . Tosi, D. (2022). Cost-effective fiber optic solutions for biosensing. *Biosensors*, 12(8) doi:10.3390/bios12080575
- Li, C., Cao, J., & Kashkynbayev, A. (2022). Global finite-time stability of delayed quaternion-valued neural networks based on a class of extended Lyapunov–Razumikhin methods. *Cognitive Neurodynamics*, doi:10.1007/s11571-022-09860-9
- Li, H., Cao, J., Kashkynbayev, A., & Cai, S. (2022). Adaptive dynamic event-triggered cluster synchronization in an array of coupled neural networks subject to cyber-attacks. *Neurocomputing*, 511, 380-398. doi:10.1016/j.neucom.2022.09.047
- Li, H., Liu, Y., Gao, X., Niu, X., Fan, H., & Wang, K. (2022). Synthesis, characterization and antibacterial properties of chitosan/Ag2S/CQDs hydrogel. *Chemical Papers*, doi:10.1007/s11696-022-02470-z
- Li, H., Zhang, Y., Pang, X., Niu, X., Zhang, D., Feng, H., . . . Wang, K. (2022). Nitrogen and sulfur-doped carbon quantum dots used as fluorescent probes. *Journal of Applied Spectroscopy*, 89(4), 761-767. doi:10.1007/s10812-022-01422-5
- Li, H., Zhong, M., ming, C., Cao, J., & Kashkynbayev, A. (2022). Adaptive event-triggered group consensus of multi-agent systems with non-identical nonlinear dynamics. *Journal of the Franklin Institute*, doi:10.1016/j.jfranklin.2022.08.039
- Liu, C., Van Meervelt, L., Peshkov, V. A., & Van der Eycken, E. V. (2022). The synthesis of diverse benzazepinoindoles via gold-catalyzed post-ugi alkyne hydroarylation/Michael addition sequence. *Organic Chemistry Frontiers*, 9(17), 4619-4624. doi:10.1039/d2qo00810f
- Lodhi, I., & Ilyassova-Schoenfeld, A. (2022). The bologna process and its impact on the higher education reforms in kazakhstan: A case of policy transfer and translations. *Studies in Higher Education*, doi:10.1080/03075079.2022.2124244
- Longinos, S., Longinou, D. -, & Wang, L. (2022). Examination of five amino acids as gas hydrate kinetic inhibitors in oil and gas industry. Paper presented at the Society of Petroleum Engineers - SPE EuropeEC - Europe Energy Conference Featured at the 83rd EAGE Annual Conference and Exhibition, EURO 2022, doi:10.2118/209701-MS Retrieved from www.scopus.com
- Longinos, S., Wang, L., Loskutova, A., Zhang, D., & Hazlett, R. (2022). Cyclic LN2Treatment of coal samples from coal basin in kazakhstan. Paper presented at the Society of Petroleum Engineers - SPE EuropeEC - Europe Energy Conference Featured at the 83rd EAGE Annual Conference and Exhibition, EURO 2022, doi:10.2118/209697-MS Retrieved from www.scopus.com

New research publications indexed by Scopus (count: 268 as of October 4)

- Longinos, S. N., Longinou, D. D., Myrzakhmetova, N., Akimbayeva, N., Zhursumbaeva, M., Abdiyev, K., . . . Parlaktuna, M. (2022). Kinetic analysis of methane hydrate formation with butterfly turbine impellers. *Molecules*, 27(14) doi:10.3390/molecules27144388
- Lukac, M., Podlaski, K., & Kameyama, M. (2022). Approximate function classification doi:10.1007/978-3-031-08754-7_28 Retrieved from www.scopus.com
- Luo, Y., Gao, X., Cao, J., & Kashkynbayev, A. (2022). Event-triggered consensus for delayed second-order leader-following heterogeneous multi-agent systems under input saturated condition. *JVC/ Journal of Vibration and Control*, doi:10.1177/10775463221126313
- Luo, Y., Gao, X., Cao, J., & Kashkynbayev, A. (2022). Finite-time consensus for second-order leader-following multi-agent systems with external disturbances and internal nonlinear dynamics based on event-triggered pinning strategy. *International Journal of Robust and Nonlinear Control*, 32(15), 8558-8575. doi:10.1002/rnc.6290
- Luo, Y., Gao, X., Li, A., & Kashkynbayev, A. (2022). Event-triggered finite-time formation control for second-order leader-following multi-agent systems with nonlinear term time delay. *International Journal of Control*, doi:10.1080/00207179.2022.2106898
- Madikyzy, M., Tilegen, M., Nazarbek, G., Mu, C., Kutzhanova, A., Li, X., . . . Xie, Y. (2022). Honghua extract mediated potent inhibition of COVID-19 host cell pathways. *Scientific Reports*, 12(1) doi:10.1038/s41598-022-15338-9
- Maham, B. (2022). Outage probability of opportunistic self-backhauled millimeter wave mobile networks. Paper presented at the IEEE Vehicular Technology Conference, , 2022-June doi:10.1109/VTC2022-Spring54318.2022.9860393 Retrieved from www.scopus.com
- Mahdawi, Q., Sagin, J., Absametov, M., & Zaryab, A. (2022). Water recharges suitability in kabul aquifer system within the upper indus basin. *Water (Switzerland)*, 14(15) doi:10.3390/w14152390
- Makin, M., Arzykulov, S., Celik, A., Eltawil, A. M., & Nauryzbayev, G. (2022). Enhancing physical layer security in large intelligent surface-aided cooperative networks. Paper presented at the IEEE Vehicular Technology Conference, , 2022-June doi:10.1109/VTC2022-Spring54318.2022.9860850 Retrieved from www.scopus.com
- Maler, D., Efimov, S., Rososhek, A., Kozlov, M., Bland, S. N., & Krasik, Y. E. (2022). Comparison of applications of underwater electrical wire explosions in different timescale generators. Paper presented at the IEEE International Conference on Plasma Science, , 2022-May doi:10.1109/ICOPS45751.2022.9813075 Retrieved from www.scopus.com
- Mamyrbekova, S., Iskakova, G., Faizullina, K., Kuziyeva, G., Abilkaiyr, N., Daniyarova, A., . . . Izmailovich, M. (2022). The diagnostic accuracy of spirometry versus peak expiratory flow test for follow-up of adult asthma patients at primary care level. *Allergy and Asthma Proceedings*, 43(5), e58-e64. doi:10.2500/aap.2022.43.220049
- Manan, S. A., & Hajar, A. (2022). "Disinvestment" in learners' multilingual identities: English learning, imagined identities, and neoliberal subjecthood in pakistan. *Journal of Language, Identity and Education*, doi:10.1080/15348458.2022.2083623
- Manan, S. A., & Tul-Kubra, K. (2022). Beyond 'two-solitudes' assumption and monolingual idealism: Generating spaces for multilingual turn in pakistan. *International Journal of Multilingualism*, 19(3), 346-367. doi:10.1080/14790718.2020.1742722
- Manshad, A. K., Nazarahari, M. J., Shafiei, A., & Moradi, S. (2022). A novel hybrid nano-smart water with soluble chlorides and sulphates and silica-montmorilant-xanthan nanocomposite for EOR: Insights from IFT and contact angle measurements and core flooding tests. *Journal of Petroleum Science and Engineering*, 218 doi:10.1016/j.petrol.2022.110942
- Martin, A., Nyman, J. N., Reinholdt, R., Cai, J., Schaedel, A. -, van der Plas, M. J. A., . . . Heinz, A. (2022). In situ transformation of electrospun nanofibers into nanofiber-reinforced hydrogels. *Nanomaterials*, 12(14) doi:10.3390/nano12142437
- McLoone, P., Tabys, D., Yunussova, S., Zhumbayeva, A., Verrall, S., Sungurtas, J., . . . McDougall, G. J. (2022). Qualitative phytochemical analysis and in vitro investigation of the immunomodulatory properties of honeys produced in kazakhstan. *Natural Product Research*, doi:10.1080/14786419.2022.2095382
- Medetov, B., Serikov, T., Tolegenova, A., & Dauren, Z. (2022). COMPARATIVE ANALYSIS OF THE PERFORMANCE OF GENERATING CRYPTOGRAPHIC CIPHERS ON THE CPU AND FPGA. *Journal of Theoretical and Applied Information Technology*, 100(15), 4813-4824. Retrieved from www.scopus.com

New research publications indexed by Scopus (count: 268 as of October 4)

- Megbenu, H. K., Tauanov, Z., Daulbayev, C., Pouloupoulos, S. G., & Baimenov, A. (2022). Effective removal of methylene blue dye by a novel 4-vinylpyridine-co-methacrylic acid cryogel: Kinetic, isotherm, and breakthrough studies. *Journal of Chemical Technology and Biotechnology*, doi:10.1002/jctb.7197
- Melnikov, A., Merodio, J., Bustamante, R., & Dorfmann, L. (2022). Bifurcation analysis of residually stressed neo-hookean and ogden electroelastic tubes. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 380(2234) doi:10.1098/rsta.2021.0331
- Mergenbayeva, S., Kumarov, A., Atabaev, T. S., Hapeshi, E., Vakros, J., Mantzavinos, D., & Pouloupoulos, S. G. (2022). Degradation of 4-tert-butylphenol in water using mono-doped (M1: Mo, W) and co-doped (M2-M1: Cu, co, zn) titania catalysts. *Nanomaterials*, 12(14) doi:10.3390/nano12142326
- Mohammadkarimi, M., Darabi, M., & Maham, B. (2022). User scheduling in massive MIMO: A joint deep learning and genetic algorithm approach. Paper presented at the IEEE Vehicular Technology Conference, , 2022-June doi:10.1109/VTC2022-Spring54318.2022.9860903 Retrieved from www.scopus.com
- Moosaei, M., Lin, Y., Akhazhanov, A., Chen, H., Wang, F., & Yang, H. (2022). OutfitGAN: Learning compatible items for generative fashion outfits. Paper presented at the IEEE Computer Society Conference on Computer Vision and Pattern Recognition Workshops, , 2022-June 2272-2276. doi:10.1109/CVPRW56347.2022.00251 Retrieved from www.scopus.com
- Mousavi Khadem, S. S., Nasiriasayesh, A., Hamed Mashhadzadeh, A., Habibzadeh, S., Sajadi, S. M., Abida, O., . . . Varma, R. S. (2022). MEL zeolite nanosheet membranes for water purification: Insights from molecular dynamics simulations. *Journal of Nanostructure in Chemistry*, 12(3), 291-305. doi:10.1007/s40097-021-00419-4
- Mukashev, D., Zhuzbay, N., Koshkinbayeva, A., Orazbayev, B., & Kappasov, Z. (2022). PhotoElasticFinger: Robot tactile fingertip based on photoelastic effect. *Sensors (Basel, Switzerland)*, 22(18) doi:10.3390/s22186807
- Mukhtarkhanov, M., Shehab, E., & Ali, M. H. (2022). Process parameter optimization for 3D printed investment casting wax pattern and its post-processing technique. *Applied Sciences (Switzerland)*, 12(14) doi:10.3390/app12146847
- Mukushev, M., Ubingazhibov, A., Kydyrbekova, A., Imashev, A., Kimmelman, V., & Sandygulova, A. (2022). FluentSigners-50: A signer independent benchmark dataset for sign language processing. *PLoS ONE*, 17(9 September) doi:10.1371/journal.pone.0273649
- Muneer, R., Hashmet, M. R., & Pourafshary, P. (2022). DLVO modeling to predict critical salt concentration to initiate fines migration pre- and post-nanofluid treatment in sandstones. *SPE Journal*, 27(4), 1915-1929. doi:10.2118/209588-PA
- Narbayev, B., & Amanbek, Y. (2022). Finite element model for wind comfort around a tall building: A case study of tower of qazaqstan doi:10.1007/978-3-031-10542-5_37 Retrieved from www.scopus.com
- Naseem, Z., Ayub, M., Shah, S. A., Ali, S. A., & Abidi, S. H. (2022). Viral infections in pakistan: Prevalence, factors affecting spread, and recommendations for control. *Journal of Infection in Developing Countries*, 16(6), 913-926. doi:10.3855/jidc.15078
- Nazim, F., Kayani, H. A., Ali Nathwani, A., Mir, F., & Abidi, S. H. (2022). CMV and EBV co-infection in HIV-infected children: Infection rates and analysis of differential expression of cytokines in HIV mono- and HIV-CMV-EBV co-infected groups. *Viruses*, 14(8) doi:10.3390/v14081823
- Nguyen, H. V., Suleimenov, K., Nguyen, B., Vo-Duy, T., Ta, M. C., & Duc Do, T. (2022). Dynamical delay unification of disturbance observation techniques for PMSM drives control. *IEEE/ASME Transactions on Mechatronics*, , 1-12. doi:10.1109/TMECH.2022.3181176
- Niyozov, S., & Bahry, S. A. (2022). DECOLONIZATION OF EDUCATION RESEARCH, POLICY-MAKING, AND PRACTICE IN CENTRAL ASIA: THE CASE OF TAJIKISTAN doi:10.1108/S1479-36792022000042A014 Retrieved from www.scopus.com
- Ofori, S., Agyeman, P. C., Adotey, E. K., Růžičková, I., & Wanner, J. (2022). Assessing the influence of treated effluent on nutrient enrichment of surface waters using water quality indices and source apportionment. *Water Practice and Technology*, 17(7), 1523-1534. doi:10.2166/wpt.2022.081
- Oladunni, A. A., Haruna, U. A., Olayemi, A. H., Adedoyin, A. B., Ndubisi, A. C., Terhemen, A., . . . Lucero-Prisno, D. E. (2022). Agriculture and food security in northern nigeria, part II: The implications of climate change doi:10.1016/bs.af2s.2022.07.005 Retrieved from www.scopus.com

New research publications indexed by Scopus (count: 268 as of October 4)

- Oleksiyenko, A., Mendoza, P., Riaño, F. E. C., Dwivedi, O. P., Kabir, A. H., Kuzhabekova, A., . . . Shchepetylnykova, I. (2022). Global crisis management and higher education: Agency and coupling in the context of wicked COVID-19 problems. *Higher Education Quarterly*, doi:10.1111/hequ.12406
- Oliva, A. A., Tumino, A., Soic, N., Prajapati, P. M., Acosta, L., Alba, R., . . . Yamaguchi, H. (2022). Study of the 12C + 16O fusion via the trojan horse method. *Nuovo Cimento Della Societa Italiana Di Fisica C*, 45(5) doi:10.1393/ncc/i2022-22119-3
- Omar, A., Seilkhan, Z., Bissembayeva, G., González-Rodríguez, O., & Rojas-Solórzano, L. (2022). The circular economy approach to evaluating end-of-life cost alternatives of solar PV panels: The case of burnoye-1, kazakhstan. *Environmental Progress and Sustainable Energy*, doi:10.1002/ep.13948
- Oralbayeva, N., Amirova, A., CohenMiller, A., & Sandygulova, A. (2022). Cognitive learning and robotics: Innovative teaching for inclusivity. *Multimodal Technologies and Interaction*, 6(8) doi:10.3390/mti6080065
- Oralsyn, G., & Sabitbek, B. (2022). Blow-up theorems for p-sub-laplacian heat operators on stratified groups. *Complex Analysis and Operator Theory*, 16(7) doi:10.1007/s11785-022-01235-6
- Ortega, M. A., García-Montero, C., Fraile-Martinez, O., Colet, P., Baizhaxynova, A., Mukhtarova, K., . . . Sarría-Santamera, A. (2022). Recapping the features of SARS-CoV-2 and its main variants: Status and future paths. *Journal of Personalized Medicine*, 12(6) doi:10.3390/jpm12060995
- Ou, Y., Tian, G., Chen, J., Chen, G., Chen, X., Li, H., . . . Zhai, Q. (2022). Feasibility studies on the utilization of recycled slag in grouting material for tunneling engineering. *Sustainability (Switzerland)*, 14(17) doi:10.3390/su141711013
- Ozawa, T., Restrepo, J. E., & Suragan, D. (2022). Inverse abstract cauchy problems. *Applicable Analysis*, 101(14), 4965-4969. doi:10.1080/00036811.2021.1877679
- Parent, T. (2022). I think; therefore, I am a fiction. *Mental fictionalism: Philosophical explorations* (pp. 217-234) doi:10.4324/9781003091073-15 Retrieved from www.scopus.com
- Parkhomenko, H. P., Umatova, Z., & Jumabekov, A. N. (2022). Photoelectrical properties of flexible quasi-interdigitated back-contact perovskite solar cells. *Materials Today: Proceedings*, doi:10.1016/j.matpr.2022.08.104
- Poddighe, D., Demirkaya, E., Sazonov, V., & Romano, M. (2022). Mycoplasma pneumoniae infections and primary immune deficiencies. *International Journal of Clinical Practice*, 2022 doi:10.1155/2022/6343818
- Poddighe, D., Romano, M., Garcia-Bournissen, F., & Demirkaya, E. (2022). Conventional and novel therapeutic options in children with familial mediterranean fever: A rare autoinflammatory disease. *British Journal of Clinical Pharmacology*, 88(6), 2484-2499. doi:10.1111/bcp.15149
- Pourmirasghariyan, M., Milimonfared, J., Yazdi, S. S. H., Biglo, A. H. A., & Rouzbehi, K. (2022). Application of max flow- min cut theory to find the best placement of electronic-based DC-PFCs for enhancing static security in MT-HVDC meshed grids. Paper presented at the 2022 30th International Conference on Electrical Engineering, ICEE 2022, 23-28. doi:10.1109/ICEE55646.2022.9827114 Retrieved from www.scopus.com
- Pozharskiy, A., Kostyukova, V., Taskuzhina, A., Nizamdinova, G., Kisselyova, N., Kalendar, R., . . . Gritsenko, D. (2022). Screening a collection of local and foreign varieties of solanum lycopersicum L. in kazakhstan for genetic markers of resistance against three tomato viruses. *Heliyon*, 8(8) doi:10.1016/j.heliyon.2022.e10095
- Rahman, H. U., Mahmood, M. H., Sama, N. U., Afzal, M., Asaruddin, M. R., & Khan, M. S. A. (2022). Impact of olive oil constituents on C-reactive protein: In silico evidence. *Journal of Oleo Science*, 71(8), 1199-1206. doi:10.5650/jos.ess22008
- Rakhimbekova, A., Kudaibergenov, B., Moldabay, D., Zharylgap, A., Ajunwa, O. M., Marsili, E., & Tosi, D. (2022). Biofilm detection by a fiber-tip ball resonator optical fiber sensor. *Biosensors*, 12(7) doi:10.3390/bios12070481
- Rakhmetullayeva, R. K., Abutalip, M., Urkimbayeva, Z. R., Kanzhigitova, D. K., Mangazbayeva, R. A., Naushabayev, A. K., . . . Zhigerbayeva, G. N. (2022). Complex of hydrogels based on acrylic acid and methyl acrylate with copper ions. *Materials Today: Proceedings*, doi:10.1016/j.matpr.2022.07.246
- Rakshit, A., & Peterson, J. (2022). Racial disparities in the small business loan market. *Journal of Small Business Management*, doi:10.1080/00472778.2022.2108824
- Ramazanova, E., Bahetnur, Y., Yessenbayeva, K., Lee, S. H., & Lee, W. (2022). Spatiotemporal evaluation of water quality and risk assessment of heavy metals in the northern caspian sea bounded by kazakhstan. *Marine Pollution Bulletin*, 181 doi:10.1016/j.marpolbul.2022.113879

New research publications indexed by Scopus (count: 268 as of October 4)

- Razeghiyadaki, A., Wei, D., Perveen, A., Zhang, D., & Wang, Y. (2022). Effects of melt temperature and non-isothermal flow in design of coat hanger dies based on flow network of non-newtonian fluids. *Polymers*, 14(15) doi:10.3390/polym14153161
- Rostamiyan, Y., Shahab, N., Spitas, C., & Hamed Mashhadzadeh, A. (2022). Mechanical properties of multi-walled beryllium-oxide nanotubes: A molecular dynamics simulation study. *Journal of Molecular Modeling*, 28(10) doi:10.1007/s00894-022-05303-8
- Rouse, L. M., Doumani Dupuy, P. N., & Baker Brite, E. (2022). The agro-pastoralism debate in central eurasia: Arguments in favor of a nuanced perspective on socio-economy in archaeological context. *Journal of Anthropological Archaeology*, 67 doi:10.1016/j.jaa.2022.101438
- Ruggeri, K., Panin, A., Vdovic, M., Večkalov, B., Abdul-Salaam, N., Achterberg, J., . . . García-Garzon, E. (2022). The globalizability of temporal discounting. *Nature Human Behaviour*, doi:10.1038/s41562-022-01392-w
- Ryan, J. M., & Nanda, S. (2022). COVID-19: Soc. inequalities and hum. possibilities. COVID-19: Social inequalities and human possibilities (pp. 1-202) doi:10.4324/9781003178019 Retrieved from www.scopus.com
- Ryan, J. M., & Nanda, S. (2022). COVID-19: Social inequalities and human possibilities. COVID-19: Social inequalities and human possibilities (pp. 1-202) doi:10.4324/9781003178019 Retrieved from www.scopus.com
- Samarkhanov, K., Batyrbekov, E., Khasenov, M., Gordienko, Y., Kotlyar, A., Martynenko, Y., . . . Kozhabayev, Z. (2022). Experimental facility to study the possibility of laser action at the p-s transition of noble gas atom under excitation by $6\text{Li}(n,\alpha)3\text{H}$ nuclear reaction products. Paper presented at the 2022 International Conference Laser Optics, ICLO 2022 - Proceedings, doi:10.1109/ICLO54117.2022.9840234 Retrieved from www.scopus.com
- Samarkhanov, K., Batyrbekov, E., Khasenov, M., Gordienko, Y., Ponkratov, Y., Martynenko, Y., . . . Bochkov, V. (2022). Study of luminescence during sputtering of lithium in noble gas by a nanosecond electron beam. Paper presented at the 2022 International Conference Laser Optics, ICLO 2022 - Proceedings, doi:10.1109/ICLO54117.2022.9839724 Retrieved from www.scopus.com
- Sandykbayeva, D., Kappassov, Z., & Orazbayev, B. (2022). VibroTouch: Active tactile sensor for contact detection and force sensing via vibrations. *Sensors*, 22(17) doi:10.3390/s22176456
- Sariyev, B., Aldabergen, A., Akzhigitov, D., Golman, B., & Spitas, C. (2022). Fabrication of highly compacted green body using multi-sized al powder under a centrifugal force. *Journal of Manufacturing and Materials Processing*, 6(4) doi:10.3390/jmmp6040079
- Sarría-Santamera, A., Khamitova, Z., Gusmanov, A., Terzic, M., Polo-Santos, M., Ortega, M. A., & Asúnsolo, A. (2022). History of endometriosis is independently associated with an increased risk of ovarian cancer. *Journal of Personalized Medicine*, 12(8) doi:10.3390/jpm12081337
- Sarsembayev, B., Yazdi, S. S. H., & Bagheri, M. (2022). Discrete PI controller with novel anti-windup scheme for charging LiPo battery in UAV: A simulation study. Paper presented at the 2022 IEEE International Conference on Environment and Electrical Engineering and 2022 IEEE Industrial and Commercial Power Systems Europe, EEEIC / I and CPS Europe 2022, doi:10.1109/EEEIC/ICPSEurope54979.2022.9854528 Retrieved from www.scopus.com
- Satayeva, A., Baimenov, A., Azat, S., Zhantikejev, U., Seisenova, A., & Tauanov, Z. (2022). Review on coal fly ash generation and utilization for resolving mercury contamination issues in central asia: Kazakhstan. *Environmental Reviews*, 30(3), 418-437. doi:10.1139/er-2021-0035
- Schilling, N. A., Kalbacher, H., & Burster, T. (2022). Variation of proteolytic cleavage sites towards the N-terminal end of the S2 subunit of the novel SARS-CoV-2 omicron sublineage BA.2.12.1. *Molecules* (Basel, Switzerland), 27(18) doi:10.3390/molecules27185817
- Schopp, N., Akhtanova, G., Panoy, P., Arbuz, A., Chae, S., Yi, A., . . . Brus, V. V. (2022). Unraveling device physics of dilute-donor narrow-bandgap organic solar cells with highly transparent active layers. *Advanced Materials*, 34(31) doi:10.1002/adma.202203796
- Schopp, N., & Brus, V. V. (2022). A review on the materials science and device physics of semitransparent organic photovoltaics. *Energies*, 15(13) doi:10.3390/en15134639
- Sergazy, S., Shulgau, Z., Zhulikeyeva, A., Ramankulov, Y., Palamarchuk, I. V., & Kulakov, I. V. (2022). Cytoprotective activity of newly synthesized 3-(arylmethylamino)-6-methyl-4-phenylpyridin-2(1H)-ones derivatives. *Molecules*, 27(17) doi:10.3390/molecules27175362

New research publications indexed by Scopus (count: 268 as of October 4)

- Serikbay, A., Bagheri, M., Zollanvari, A., & Saukhimov, A. A. (2022). CNN-based classification of contaminated high voltage insulator surface. Paper presented at the 2022 IEEE International Conference on Environment and Electrical Engineering and 2022 IEEE Industrial and Commercial Power Systems Europe, IEEEIC / I and CPS Europe 2022, doi:10.1109/IEEEIC/ICPSEurope54979.2022.9854762 Retrieved from www.scopus.com
- Serikov, G., Wang, L., Asif, M., & Hazlett, R. (2022). Simulation evaluation of CO₂-ECBM potential in karaganda coal basin in kazakhstan. Paper presented at the Society of Petroleum Engineers - SPE Europec - Europe Energy Conference Featured at the 83rd EAGE Annual Conference and Exhibition, EURO 2022, doi:10.2118/209698-MS Retrieved from www.scopus.com
- Serikova-Esengeldina, D., Glushkova, N., Abdushukurova, G., Mussakhanova, A., Mukhamejanova, A., Khismetova, Z., . . . Semenova, Y. (2022). Cost-utility analysis of total knee arthroplasty alone and in comparison with post-surgical rehabilitation and conservative treatment in the republic of kazakhstan. *Cost Effectiveness and Resource Allocation*, 20(1) doi:10.1186/s12962-022-00379-8
- Sharimova, A., & Wilson, E. (2022). Informal learning through social media: Exploring the experiences of teachers in virtual professional communities in kazakhstan. *Professional Development in Education* , doi:10.1080/19415257.2022.2097291
- Sharma, D., & Linder, E. V. (2022). Double source lensing probing high redshift cosmology. *Journal of Cosmology and Astroparticle Physics*, 2022(7) doi:10.1088/1475-7516/2022/07/033
- Sheshjavani, A. G., Khonsari, A., Shariatpanahi, S. P., Moradian, M., & Dadlani, A. (2022). Content caching in shared medium networks with non-uniform and user-dependent demands. Paper presented at the IEEE International Conference on Communications, , 2022-May 2501-2506. doi:10.1109/ICC45855.2022.9839153 Retrieved from www.scopus.com
- Silab, M. V., Hassanpour, S. B., Khonsari, A., & Dadlani, A. (2022). On skipping redundant computation via smart task deployment for faster serverless. Paper presented at the IEEE International Conference on Communications, , 2022-May 5475-5480. doi:10.1109/ICC45855.2022.9838742 Retrieved from www.scopus.com
- Singh, P. B., & Newman, A. G. (2022). HP1-driven micro-phase separation of heterochromatin-like Domains/Complexes. *Epigenetics Insights*, 15 doi:10.1177/25168657221109766
- Smith, B. (2022). Josiah child, interest rates, and john locke's for a general naturalization. *Modern Intellectual History*, 19(3), 661-680. doi:10.1017/S1479244321000494
- Soltabayev, B., Yergaliuly, G., Ajjaq, A., Beldeubayev, A., Acar, S., Bakenov, Z., & Mentbayeva, A. (2022). Quick NO gas sensing by ti-doped flower-rod-like ZnO structures synthesized by the SILAR method. *ACS Applied Materials and Interfaces*, doi:10.1021/acsaami.2c10055
- Su, X., Wang, R., Li, X., Araby, S., Kuan, H. -, Naeem, M., & Ma, J. (2022). A comparative study of polymer nanocomposites containing multi-walled carbon nanotubes and graphene nanoplatelets. *Nano Materials Science*, 4(3), 185-204. doi:10.1016/j.nanoms.2021.08.003
- Suleimenova, B., Aimbetov, B., Zhakupov, D., Shah, D., & Sarbassov, Y. (2022). Co-firing of refuse-derived fuel with ekibastuz coal in a bubbling fluidized bed reactor: Analysis of emissions and ash char characteristics. *Energies*, 15(16) doi:10.3390/en15165785
- Sun, H., Zou, H., Li, X., Memon, S. A., Yuan, B., Xing, F., . . . Ren, J. (2022). Combined effects of sulfate and chloride attack on steel reinforced mortar under Drying-Immersion cycles. *Buildings*, 12(8) doi:10.3390/buildings12081252
- Suragan, D., & Yessirkegenov, N. (2022). Sharp remainder of the poincaré inequality for baouendi-grushin vector fields. *Asian-European Journal of Mathematics*, doi:10.1142/S1793557123500419
- Syarifudin, A., Satyanaga, A., Wijaya, M., Moon, S. -, & Kim, J. (2022). Sediment transport patterns of channels on tidal lowland. *Fluids*, 7(8) doi:10.3390/fluids7080277
- Tao, D., Kalendar, R., & Paterson, A. H. (2022). Editorial: Interspecific hybridization in plant biology. *Frontiers in Plant Science*, 13 doi:10.3389/fpls.2022.1026492
- Tappen, M., Bukhsianidze, M., Ferring, R., Coil, R., & Lordkipanidze, D. (2022). Life and death at dmanisi, georgia: Taphonomic signals from the fossil mammals. *Journal of Human Evolution*, 171 doi:10.1016/j.jhevol.2022.103249
- Tazikeh, S., Davoudi, A., Shafiei, A., Parsaei, H., Atabaev, T. S., & Ivakhnenko, O. P. (2022). A comparison between the perturbed-chain statistical associating fluid theory equation of state and machine learning modeling approaches in asphaltene onset pressure and bubble point pressure prediction during gas injection. *ACS Omega*, 7(34), 30113-30124. doi:10.1021/acsomega.2c03192

New research publications indexed by Scopus (count: 268 as of October 4)

- Tazikeh, S., Shafiei, A., Yerkenov, T., Abenov, A., Seitmaganbetov, N., & Sh. Atabaev, T. (2022). A systematic and critical review of asphaltene adsorption from macroscopic to microscopic scale: Theoretical, experimental, statistical, intelligent, and molecular dynamics simulation approaches. *Fuel*, 329 doi:10.1016/j.fuel.2022.125379
- Temireyeva, A., Zhunussova, K., Aidabulov, M., Shah, D., & Sarbassov, Y. (2022). Exploring the mitigation of greenhouse gas emissions from the current municipal solid waste system of kazakhstan: Case study of nur-sultan city. Paper presented at the IOP Conference Series: Earth and Environmental Science, , 1074(1) doi:10.1088/1755-1315/1074/1/012031 Retrieved from www.scopus.com
- Terzic, M., Aimagambetova, G., Bapayeva, G., Ukybassova, T., Kenbayeva, K., Kaiyrylkyzy, A., . . . Laganà, A. S. (2022). Pipelle endometrial sampling success rates in kazakhstani settings: Results from a prospective cohort analysis. *Journal of Obstetrics and Gynaecology*, 42(5), 1255-1260. doi:10.1080/01443615.2021.1953452
- Tezekbayev, M., Nikoulina, V., Gallé, M., & Assylbekov, Z. (2022). Speeding up entmax. Paper presented at the Findings of the Association for Computational Linguistics: NAACL 2022 - Findings, 1142-1158. Retrieved from www.scopus.com
- Tleuken, A., Tokazhanov, G., Jemal, K. M., Shaimakhanov, R., Sovetbek, M., & Karaca, F. (2022). Legislative, institutional, industrial and governmental involvement in circular economy in central asia: A systematic review. *Sustainability (Switzerland)*, 14(13) doi:10.3390/su14138064
- Toktarbaiuly, O., Syrlybekov, A., Nurage, N., Sugurbekova, G., & Shvets, I. V. (2022). Surface faceting of vicinal SrTiO₃(1 0 0). *Materials Today: Proceedings*, doi:10.1016/j.matpr.2022.08.283
- Tolepbergen, A. (2022). The role of labor market structure and shocks for monetary policy in kazakhstan. *International Journal of Economic Policy Studies*, 16(1), 179-210. doi:10.1007/s42495-021-00073-2
- Torgautov, B., Zhanabayev, A., Tleuken, A., Turkyilmaz, A., Borucki, C., & Karaca, F. (2022). Performance assessment of construction companies for the circular economy: A balanced scorecard approach. *Sustainable Production and Consumption*, 33, 991-1004. doi:10.1016/j.spc.2022.08.021
- Triantafyllou, A., Zorbas, D., & Sarigiannidis, P. (2022). Time-slotted LoRa MAC with variable payload support. *Computer Communications*, 193, 146-154. doi:10.1016/j.comcom.2022.06.043
- Tsakalerou, M., Efthymiadis, D., & Abilez, A. (2022). An intelligent methodology for the use of multi-criteria decision analysis in impact assessment: The case of real-world offshore construction. *Scientific Reports*, 12(1) doi:10.1038/s41598-022-19554-1
- Tsyrempilov, N., Bigozhin, U., & Zhumabayev, B. (2022). A nation's holy land: Kazakhstan's large-scale national project to map its sacred geography. *Nationalities Papers*, 50(4), 704-721. doi:10.1017/nps.2021.22
- Tukaziban, A., Shon, C. -, Orynbassarov, I., Sandybay, S., Syzdykov, D., Zhang, D., & Kim, J. R. (2022). Mechanical, swelling, and thermal properties of geopolymer mixture containing basic oxygen furnace slag aggregates. Paper presented at the IOP Conference Series: Earth and Environmental Science, , 1050(1) doi:10.1088/1755-1315/1050/1/012021 Retrieved from www.scopus.com
- Turgimbayeva, A., Zein, U., Zharkov, D. O., Ramankulov, Y., Saparbaev, M., & Abeldenov, S. (2022). Cloning and characterization of the major AP endonuclease from staphylococcus aureus. *DNA Repair*, 119 doi:10.1016/j.dnarep.2022.103390
- Tursumbayeva, M., Kerimray, A., Karaca, F., & Permadi, D. A. (2022). Planetary boundary layer and its relationship with PM_{2.5} concentrations in almaty, kazakhstan. *Aerosol and Air Quality Research*, 22(8) doi:10.4209/aaqr.210294
- Umurzakov, K. T., Shalgumbayeva, G. M., Kaydarova, D. R., Smail, Y., Ibrayev, A., Sagidullin, S. O., & Semenova, Y. M. (2022). Epidemiological characteristics of male reproductive cancers in the republic of kazakhstan: Ten-year trends. *Iranian Journal of Public Health*, 51(8), 1807-1816. Retrieved from www.scopus.com
- Utesov, A. B., & Bazarkhanova, A. A. (2022). Optimal computing units in the problem of discretizing solutions of the Klein–Gordon equation and their limit errors. *Differential Equations*, 58(5), 698-711. doi:10.1134/S0012266122050093
- Valagiannopoulos, C. (2022). Multistability in coupled nonlinear metasurfaces. *IEEE Transactions on Antennas and Propagation*, 70(7), 5534-5540. doi:10.1109/TAP.2022.3145455
- Viderman, D., Aubakirova, M., Umbetzhanov, Y., Kulkaeva, G., Shalekenov, S. B., & Abdildin, Y. G. (2022). Ultrasound-guided erector spinae plane block in thoracolumbar spinal surgery: A systematic review and meta-analysis. *Frontiers in Medicine*, 9 doi:10.3389/fmed.2022.932101

New research publications indexed by Scopus (count: 268 as of October 4)

- Viderman, D., Tapinova, K., & Abdildin, Y. G. (2022). Mechanisms of cerebral vasospasm and cerebral ischaemia in subarachnoid haemorrhage. *Clinical Physiology and Functional Imaging*, doi:10.1111/cpf.12787
- Vostrikova, A., Pechenkina, V., Danilova, M., Boronnikova, S., & Kalendar, R. (2022). Gene polymorphism and total genetic score in martial arts athletes with different athletic qualifications. *Genes*, 13(9) doi:10.3390/genes13091677
- Wang, S., Zhang, X., & Marsili, E. (2022). Electrochemical characteristics of shewanella loihica PV-4 on reticulated vitreous carbon (RVC) with different potentials applied. *Molecules*, 27(16) doi:10.3390/molecules27165330
- Wayo, D. D. K., Irawan, S., Khan, J. A., & Fitrianti. (2022). CFD validation for assessing the repercussions of filter cake breakers; EDTA and SiO₂ on filter cake return permeability. *Applied Artificial Intelligence*, 36(1) doi:10.1080/08839514.2022.2112551
- Xu, Y., Geldsetzer, P., Manne-Goehler, J., Theilmann, M., Marcus, M. -, Zhumadilov, Z., . . . Probst, C. (2022). The socioeconomic gradient of alcohol use: An analysis of nationally representative survey data from 55 low-income and middle-income countries. *The Lancet Global Health*, 10(9), e1268-e1280. doi:10.1016/S2214-109X(22)00273-X
- Yakavets, N., Winter, L., Malone, K., Zhontayeva, Z., & Khamidulina, Z. (2022). Educational reform and teachers' agency in reconstructing pedagogical practices in kazakhstan. *Journal of Educational Change*, doi:10.1007/s10833-022-09463-5
- Yang, Q., Olaifa, K., Andrew, F. P., Ajibade, P. A., Ajunwa, O. M., & Marsili, E. (2022). Assessment of physiological and electrochemical effects of a repurposed zinc dithiocarbamate complex on acinetobacter baumannii biofilms. *Scientific Reports*, 12(1) doi:10.1038/s41598-022-16047-z
- Yarovenko, V., Park, J. -, & Lee, M. -. (2022). Re-thinking pitfalls of premodel building for adaptive CNNs model selection on ImageNet. Paper presented at the CTISC 2022 - 2022 4th International Conference on Advances in Computer Technology, Information Science and Communications, doi:10.1109/CTISC54888.2022.9849779 Retrieved from www.scopus.com
- Yazdi, S. S. H., Namadmalan, A., Kapanov, A., Zolanvari, A., & Bagheri, M. (2022). Optimal design of D-IPT systems considering mutual inductances and number and location of repeaters. Paper presented at the 2022 IEEE International Conference on Environment and Electrical Engineering and 2022 IEEE Industrial and Commercial Power Systems Europe, IEEEIC / I and CPS Europe 2022, doi:10.1109/IEEEIC/ICPSEurope54979.2022.9854557 Retrieved from www.scopus.com
- Yazdipour, F., Amouei Torkmahalleh, M., Kamyabi, M., & Sotudeh-Gharebagh, R. (2022). On solvent losses in amine absorption columns. *ACS Sustainable Chemistry and Engineering*, 10(34), 11154-11164. doi:10.1021/acssuschemeng.2c02179
- Ybrayev, Z. (2022). Distributional consequences of monetary policy in emerging economies: Dollarization, domestic inflation, and income divergence. *Comparative Economic Studies*, 64(2), 186-210. doi:10.1057/s41294-021-00163-2
- Yegorov, S., Kadyrova, I., Negmetzhanov, B., Kolesnikova, Y., Kolesnichenko, S., Korshukov, I., . . . Babenko, D. (2022). Sputnik-V reactogenicity and immunogenicity in the blood and mucosa: A prospective cohort study. *Scientific Reports*, 12(1) doi:10.1038/s41598-022-17514-3
- Yergaziyeva, G., Makayeva, N., Abdisattar, A., Yeleuov, M., Soloviev, S., Anissova, M., . . . Daulbayev, C. (2022). Electrochemical synthesis of fe-containing composite for decomposition of methane into CO_x-free hydrogen and nano-carbon. *Chemical Papers*, doi:10.1007/s11696-022-02420-9
- Yerkenov, T., Tazikeh, S., Tatar, A., & Shafiei, A. (2022). Asphaltene precipitation prediction during bitumen recovery: Experimental approach versus population balance and connectionist models. *ACS Omega*, 7(37), 33123-33137. doi:10.1021/acsomega.2c03249
- Yeshmukhametov, A., & Koganezawa, K. (2022). Design and development of wire-driven pulley guided continuum robot (WPGCR) arm and friction analysis. Paper presented at the IEEE/ASME International Conference on Advanced Intelligent Mechatronics, AIM, , 2022-July 83-88. doi:10.1109/AIM52237.2022.9863244 Retrieved from www.scopus.com
- Yeshmukhametov, A., Koganezawa, K., Yamamoto, Y., Buribayev, Z., Mukhtar, Z., & Amirgaliyev, Y. (2022). Development of continuum robot arm and gripper for harvesting cherry tomatoes. *Applied Sciences (Switzerland)*, 12(14) doi:10.3390/app12146922
- Zarghami Dehaghani, M., Farzadian, O., Kostas, K. V., Molaei, F., Spitas, C., & Hamed Mashhadzadeh, A. (2022). Theoretical study of heat transfer across biphenylene/h-BN superlattice nanoribbons. *Physica E: Low-Dimensional Systems and Nanostructures*, 144 doi:10.1016/j.

New research publications indexed by Scopus (count: 268 as of October 4)

- Zhai, Q., Ye, W., Rahardjo, H., Satyanaga, A., Du, Y., Dai, G., & Zhao, X. (2022). Estimation of the hydraulic conductivity of unsaturated soil incorporating the film flow. *Canadian Geotechnical Journal*, 59(9), 1679-1684. doi:10.1139/cgj-2021-0361
- Zhakupov, D., Kulmukanova, L., Sarbassov, Y., & Shah, D. (2022). Flue gas analysis for biomass and coal co-firing in fluidized bed: Process simulation and validation. *International Journal of Coal Science and Technology*, 9(1) doi:10.1007/s40789-022-00531-y
- Zhang, Y., He, W., Li, X., Peng, H., Rabie, K., Nauryzbayev, G., . . . Zhu, M. (2022). Covert communication in downlink NOMA systems with channel uncertainty. *IEEE Sensors Journal*, , 1-1. doi:10.1109/JSEN.2022.3201319
- Zhangaskanov, D., Batay, S., Kamalov, B., Zhao, Y., Su, X., & Kweeng, E. (2022). High-fidelity 2-way FSI simulation of a wind turbine using fully structured multiblock meshes in OpenFoam for accurate aero-elastic analysis. *Fluids*, 7(5) doi:10.3390/fluids7050169
- Zhumanova, K., Serik, L., Molkenova, A., & Atabaev, T. S. (2022). UV light blocking and conversion by porous europium-doped titanium dioxide (TiO₂-eu) thin films for potential protection of photovoltaic devices. *Materials Today Chemistry*, 26 doi:10.1016/j.mtchem.2022.101171
- Zorbas, D. (2022). ActLoRa: Supporting actuators in LoRaWAN. Paper presented at the IEEE International Conference on Communications, , 2022-May 4426-4431. doi:10.1109/ICC45855.2022.9839166 Retrieved from www.scopus.com
- Zorbas, D. (2022). Improving LoRaWAN downlink performance in the EU868 spectrum. *Computer Communications*, 195, 303-314. doi:10.1016/j.comcom.2022.09.001