

ISSN 2518-1483 (Online),  
ISSN 2224-5227 (Print)

2018 • 5

ҚАЗАҚСТАН РЕСПУБЛИКАСЫ  
ҰЛТТЫҚ ҒЫЛЫМ АКАДЕМИЯСЫНЫҢ

## БАЯНДАМАЛАРЫ

---

### ДОКЛАДЫ

НАЦИОНАЛЬНОЙ АКАДЕМИИ НАУК  
РЕСПУБЛИКИ КАЗАХСТАН

### REPORTS

OF THE NATIONAL ACADEMY OF SCIENCES  
OF THE REPUBLIC OF KAZAKHSTAN

ЖУРНАЛ 1944 ЖЫЛДАН ШЫҒА БАСТАҒАН  
ЖУРНАЛ ИЗДАЕТСЯ С 1944 г.  
PUBLISHED SINCE 1944



Бас редакторы  
х.ғ.д., проф., ҚР ҰҒА академигі **М.Ж. Жұрынов**

Редакция алқасы:

**Адекенов С.М.** проф., академик (Қазақстан) (бас ред. орынбасары)  
**Величкин В.И.** проф., корр.-мүшесі (Ресей)  
**Вольдемар Вуйцик** проф. (Польша)  
**Гончарук В.В.** проф., академик (Украина)  
**Гордиенко А.И.** проф., академик (Белорус)  
**Дука Г.** проф., академик (Молдова)  
**Илолов М.И.** проф., академик (Тәжікстан),  
**Леска Богуслава** проф. (Польша),  
**Локшин В.Н.** проф. чл.-корр. (Қазақстан)  
**Нараев В.Н.** проф. (Ресей)  
**Неклюдов И.М.** проф., академик (Украина)  
**Нур Изура Удзир** проф. (Малайзия)  
**Перни Стефано** проф. (Ұлыбритания)  
**Потапов В.А.** проф. (Украина)  
**Прокопович Полина** проф. (Ұлыбритания)  
**Омбаев А.М.** проф., корр.-мүшесі (Қазақстан)  
**Өтелбаев М.О.** проф., академик (Қазақстан)  
**Садыбеков М.А.** проф., корр.-мүшесі (Қазақстан)  
**Сатаев М.И.** проф., корр.-мүшесі (Қазақстан)  
**Северский И.В.** проф., академик (Қазақстан)  
**Сикорски Марек** проф., (Польша)  
**Рамазанов Т.С.** проф., академик (Қазақстан)  
**Такибаев Н.Ж.** проф., академик (Қазақстан), бас ред. орынбасары  
**Харин С.Н.** проф., академик (Қазақстан)  
**Чечин Л.М.** проф., корр.-мүшесі (Қазақстан)  
**Харун Парлар** проф. (Германия)  
**Энджун Гао** проф. (Қытай)  
**Эркебаев А.Э.** проф., академик (Қырғыстан)

«Қазақстан Республикасы Ұлттық ғылым академиясының баяндамалары»

ISSN 2518-1483 (Online),

ISSN 2224-5227 (Print)

Меншіктенуші: «Қазақстан Республикасының Ұлттық ғылым академиясы» Республикалық қоғамдық бірлестігі (Алматы қ.)  
Қазақстан республикасының Мәдениет пен ақпарат министрлігінің Ақпарат және мұрағат комитетінде 01.06.2006 ж.  
берілген №5540-Ж мерзімдік басылым тіркеуіне қойылу туралы куәлік

Мерзімділігі: жылына 6 рет.

Тиражы: 500 дана.

Редакцияның мекенжайы: 050010, Алматы қ., Шевченко көш., 28, 219 бөл., 220, тел.: 272-13-19, 272-13-18,  
<http://nauka-nanrk.kz>, reports-science.kz

© Қазақстан Республикасының Ұлттық ғылым академиясы, 2018

Типографияның мекенжайы: «Аруна» ЖК, Алматы қ., Муратбаева көш., 75.

Главный редактор  
д.х.н., проф., академик НАН РК **М. Ж. Журинов**

Редакционная коллегия:

**Адекенов С.М.** проф., академик (Казахстан) (зам. гл. ред.)  
**Величкин В.И.** проф., чл.-корр. (Россия)  
**Вольдемар Вуйцик** проф. (Польша)  
**Гончарук В.В.** проф., академик (Украина)  
**Гордиенко А.И.** проф., академик (Беларусь)  
**Дука Г.** проф., академик (Молдова)  
**Илолов М.И.** проф., академик (Таджикистан),  
**Леска Богуслава** проф. (Польша),  
**Локшин В.Н.** проф. чл.-корр. (Казахстан)  
**Нараев В.Н.** проф. (Россия)  
**Неклюдов И.М.** проф., академик (Украина)  
**Нур Изура Удзир** проф. (Малайзия)  
**Перни Стефано** проф. (Великобритания)  
**Потапов В.А.** проф. (Украина)  
**Прокопович Полина** проф. (Великобритания)  
**Омбаев А.М.** проф., чл.-корр. (Казахстан)  
**Отелбаев М.О.** проф., академик (Казахстан)  
**Садыбеков М.А.** проф., чл.-корр. (Казахстан)  
**Сатаев М.И.** проф., чл.-корр. (Казахстан)  
**Северский И.В.** проф., академик (Казахстан)  
**Сикорски Марек** проф., (Польша)  
**Рамазанов Т.С.** проф., академик (Казахстан)  
**Такибаев Н.Ж.** проф., академик (Казахстан), зам. гл. ред.  
**Харин С.Н.** проф., академик (Казахстан)  
**Чечин Л.М.** проф., чл.-корр. (Казахстан)  
**Харун Парлар** проф. (Германия)  
**Энджун Гао** проф. (Китай)  
**Эркебаев А.Э.** проф., академик (Кыргызстан)

Доклады Национальной академии наук Республики Казахстан»

ISSN 2518-1483 (Online),

ISSN 2224-5227 (Print)

Собственник: Республиканское общественное объединение «Национальная академия наук Республики Казахстан» (г. Алматы)

Свидетельство о постановке на учет периодического печатного издания в Комитете информации и архивов Министерства культуры и информации Республики Казахстан №5540-Ж, выданное 01.06.2006 г.

Периодичность: 6 раз в год.

Тираж: 500 экземпляров

Адрес редакции: 050010, г.Алматы, ул.Шевченко, 28, ком.218-220, тел. 272-13-19, 272-13-18

<http://nauka-nanrk.kz> [reports-science.kz](http://reports-science.kz)

---

©Национальная академия наук Республики Казахстан, 2018 г.

Адрес типографии: ИП «Аруна», г.Алматы, ул.Муратбаева, 75

**E d i t o r i n c h i e f**doctor of chemistry, professor, academician of NAS RK **M.Zh. Zhurinov****E d i t o r i a l b o a r d :****Adekenov S.M.** prof., academician (Kazakhstan) (deputy editor in chief)**Velichkin V.I.** prof., corr. member (Russia)**Voitsik Valdemar** prof. (Poland)**Goncharuk V.V.** prof., academician (Ukraine)**Gordiyenko A.I.** prof., academician (Belarus)**Duka G.** prof., academician (Moldova)**Iolov M.I.** prof., academician (Tadjikistan),**Leska Boguslava** prof. (Poland),**Lokshin V.N.** prof., corr. member. (Kazakhstan)**Narayev V.N.** prof. (Russia)**Nekludov I.M.** prof., academician (Ukraine)**Nur Izura Udzir** prof. (Malaysia)**Perni Stephano** prof. (Great Britain)**Potapov V.A.** prof. (Ukraine)**Prokopovich Polina** prof. (Great Britain)**Ombayev A.M.** prof., corr. member. (Kazakhstan)**Otelbayv M.O.** prof., academician (Kazakhstan)**Sadybekov M.A.** prof., corr. member. (Kazakhstan)**Satayev M.I.** prof., corr. member. (Kazakhstan)**Severskiy I.V.** prof., academician (Kazakhstan)**Sikorski Marek** prof., (Poland)**Ramazanov T.S.** prof., academician (Kazakhstan)**Takibayev N.Zh.** prof., academician (Kazakhstan), deputy editor in chief**Kharin S.N.** prof., academician (Kazakhstan)**Chechin L.M.** prof., corr. member. (Kazakhstan)**Kharun Parlar** prof. (Germany)**Endzhun Gao** prof. (China)**Erkebayev A.Ye.** prof., academician (Kyrgyzstan)**Reports of the National Academy of Sciences of the Republic of Kazakhstan.****ISSN 2224-5227****ISSN 2518-1483 (Online),****ISSN 2224-5227 (Print)**

Owner: RPA "National Academy of Sciences of the Republic of Kazakhstan" (Almaty)

The certificate of registration of a periodic printed publication in the Committee of Information and Archives of the Ministry of Culture and Information of the Republic of Kazakhstan N 5540-Ж, issued 01.06.2006

Periodicity: 6 times a year

Circulation: 500 copies

Editorial address: 28, Shevchenko str., of.219-220, Almaty, 050010, tel. 272-13-19, 272-13-18,

<http://nauka-nanrk.kz> / [reports-science.kz](http://reports-science.kz)

**Zh.E. Kenzhebayeva**

JSC «Financial Academy», Astana, Kazakhstan

[janka\\_taz@mail.ru](mailto:janka_taz@mail.ru)

## GEOINFORMATION TECHNOLOGIES IN VARIOUS SYSTEMS

**Abstract.** This article examines geoinformation systems in various branches of education and industry. GIS-technologies are an effective tool for creating demonstration materials and electronic manuals for performing laboratory work, for mining, in finding the most favorable harvest places for the agricultural sector of the economy, etc. Thus, the search for minerals begins with the comparison of satellite imagery with the geological maps obtained earlier on the investigated territory of the Earth. Also, modern information technologies have become one of the main elements of new areas of resource-saving direction in the field of agricultural crops. Thus, a high degree of informatization of the society contributes to the active introduction and use of information technologies, both in the education system and in business.

**Keywords:** information technology, system, geography, maps, education, extraction, industry.

### INTRODUCTION

The ideology of GIS education is built on the one hand to ensure the content of the courses being read by theoretical content and modern practical work, and on the other hand to use computer technologies for organizing the educational process. This is especially evident in the development of educational and scientific GIS. These systems serve as a means of planning and organizing topographic and geodetic works, many types of geographic, biogeographical and geological surveys, the results of which can be used by teachers. It should be noted that 90% of these GIS are created by students who pass all the GIS mapping cycles - from design to creation of thematic databases and maps. Geoinformation systems are an effective means of creating a demonstration-methodological material and electronic manuals for performing laboratory work.

In the Word editor environment, methodical instructions have been prepared for working with such systems as Surfer, MapInfo, Geodraw / Geographer, Microstation, illustrated with examples of performing separate procedures.

### MAIN PART

The special task of students' GIS education is to teach the management of data and, more importantly, the use of professional models of socio-economic and natural processes, multidimensional analysis techniques and expert analysis in the optimization of nature management and environmental monitoring.

The basis of the GIS-discipline block is:

1. Introduction to GIS;
2. Databases;
3. Computer graphics;
4. Creation of GIS and
5. Use of GIS.

In the introduction to GIS, prototype GIS, historical reference, typical GIS architecture, functions of basic modules, data formats, organization of data management, basic methods of data analysis, a survey of modern GIS shells and their comparative characteristics, industry specialization of modern GIS.

Modern experience in the application of the software packages under consideration is discussed in the subject "Use of GIS". In this discipline, concrete results are examined from domestic and foreign practice.

The use of modern geology information systems is widespread and practically unlimited. GIS is used successfully in both military and civil affairs:

- creation of navigational and hydrographic maps;
- solving urban problems (planning, designing of engineering systems);
- in the management of forest, agricultural, fishery resources;
- topographic mapping;
- geology, geophysics;
- business (mapping of purchasing power zones of the population, analysis of transport access areas, delivery and routing);
- demographic analysis, etc. The use of school GIS-technologies contributes to the formation of the most important geographical skills:
  - read information stored in digital geographic maps;
  - search for geographical objects by specified parameters, for example, by object names;
  - carry out measurements and calculations on digital maps;
  - translate in the process of multiple exercises the ability to determine the geographical coordinates of the skill;
  - To form the students' spatial thinking, demonstrating the studied natural objects in a three-dimensional dimensional dimension;
  - Compose your own digital maps, especially from the observations of students, for example, the weather conditions of their locality.

Thus, a high degree of informatization of the society contributes to the active introduction and use of information technologies in the educational general educational process, which allows to bring the teaching to a higher level, to integrate knowledge into various fields and subjects, and to pupils to feel themselves active participants in the learning process, to acquire new knowledge, skills, skills and to be in constant search and development of oneself.

The search for minerals begins with the comparison of satellite images with geological maps obtained earlier on the investigated territory of the Earth. The main factor of the presence of natural resources in this or that sector is the presence of plicative (folded) structures, as well as zones of faults and lineaments (rectilinear geological formations that are well reflected in space images). Geologists, analyzes the direction, length, density, and other properties of the map according to the map and, from these data, determines deposits of minerals.

The active use of the power and flexibility of the technology of geology information systems (GIS technology) can drastically help solve the problem of increasing the efficiency of oil prospecting and operating with oil-related data. When combined with other oil software, GIS can significantly speed up data retrieval and reduce the cost of their exchange.

GIS is a system for collecting, storing, analyzing and graphically visualizing geographic data and associated information about the objects under study. In this article, the concept of the geographic information system is used as a software product.

Before the analysis of the oil data begins, the circulation to the necessary data from the universal computers can be taken from geologists three-quarters of the time. And when it comes to the actual analysis, data exchange between hundreds of analytical programs takes even more time. The use of GIS technology redistributes the time resources so that the main goal of geologists is fulfilled - to give an accurate forecast of the economic value of the proposed oil fields.

Software vendors for the oil and gas industry, which integrated GIS technology with their specialized products, have achieved the integration of petroleum data in one software environment. As a result, geologists can easily transfer data between different software for geophysical, petro physical and seismic analysis. Access to data based on a general-purpose computer is much faster when controlled by a software interface that minimizes data retrieval time.

Customers can download the data directly into the GIS and immediately begin the analysis. In addition, data vendors integrate many types of data in multimedia GIS databases: aerial photographs, satellite data and paper maps. GIS can combine all these data sources, transforming them into a complete digital map of the oil-bearing region. With this integration capability, data vendors are likely to deliver even more specialized products to the market, along with data.

This enhanced integration enhances the power of GIS systems, especially their flexibility in adapting too many areas of the oil industry - now mostly applications in exploration and production, but they will obviously be followed by application programs in other areas. GIS will remain a vital tool for oil geologists and a central element in the integration of data and applications for this industry.

Modern information technologies have become one of the main elements of new areas of resource-saving direction in the field of agricultural crops, known as "precise farming" or "precision farming". This approach, as international experience shows, provides a much greater economic effect and, most importantly, improves the reproduction of soil fertility and the level of ecological purity of agricultural products. World practice has shown that with the right use of precision agriculture, technology pays off quickly by saving fertilizers, seeds, fuel, by reducing labor costs, by increasing the fertility of soils. According to statistics, 80% of farmers in the United States to some extent use technology of precision farming. And they, of course, know how to take profits.

The first significant results in the use of electronic devices on farming. Technicians have developed machines for plant protection. For example, the Tecnomat Hydroelectron sprayer, which won a gold medal at the SIMA-1976 international exhibition in Paris, was equipped with an electronic regulator for supplying the solution in proportion to the speed of the unit. A similar machine was developed by the English company Agmet. In comparison with the analogues used in the CIS countries, they maintain a constant solution flow per unit time, and the rate of its application per 1 ha varies significantly with each gear change, engine speed and wheel slippage, which saves up to 20% of the pesticides. And this is not only an economic, but also an environmental effect.

It was more difficult to solve the problems of the exact sowing of seeds of grain crops. Experimental samples of such seeders were shown at an international exhibition in Munich in 1982, and the serial machine with the electronic regulator of seeding by Blanchot appeared only after three years and was marked at the Paris exhibition SIMA-1985. The company Rider (Germany) went even further, creating a Saxonia seeder, which provides the exposure not only of the specified distance between the seeds in a row, but also the depth of their bedding.

Significant successes in the electronization of agricultural crops. Techniques have reached the firm Amazone, Diadem, Rotina, Lely, etc. In centrifugal type machines, they have achieved a correlation of fertilizer application rate per hectare from the unit speed. In addition, the frequency of rotation of the scattering discs and the actual dose of fertilizers applied per hectare are constantly displayed on the monitor, and the last tractor driver can change from his workplace.

Using modern information technologies, farmers can obtain very accurate data on the state of the field and use this information to improve crop cultivation, and to maximize profits from each square meter of the field. This became possible due to the use of precision growing technologies, precision or "precision" farming technologies including:

- Geoinformation systems (GIS);
  - Earth remote sensing technology (ERS);
  - Global Positioning Technology (GPS);
  - variable rate technology (Variable Rate Technology);
  - Technology management of agricultural machines using sensors and microcontrollers;
1. Yield Monitor Technologies.

The main difference between traditional and exact farming is the use of modern information technologies for the collection, processing and analysis of various data with high spatial and temporal resolution for decision making and agricultural work. Thus, the basis of all production technologies for precision farming is geoinformation systems based on remote sensing (ERS) technologies, which allows you to shoot, store and process information to indicate characteristics of crops or arable land.

## CONCLUSION

Detailed digital field maps obtained using unmanned aerial vehicles make it possible to plan, strictly record and control all agricultural operations, as they are based on accurate knowledge of the area of fields, the extent of roads, information about fields and other objects. Based on these maps, a full analysis of the conditions that affect the growth of plants in this particular area (or even in 10x10m or 100x100m areas) is carried out. Field maps form the basis for crop rotation models and are used to optimize production in order to maximize profits, as well as for the rational use of all resources involved in production.

Using a multispectral camera as a sensor for remote sensing of UAVs, as well as geology information technologies of GIS, it is possible to carry out an effective survey and inventory of lands, to accompany reclamation, to quickly create NDVI maps, to plan fertilization and to supervise agro technical activities.

When conducting regular aerial surveys of agricultural lands, daily or once a week, and post-processing them in specialized software, it is possible to trace the dynamics of changes within the same field. These data can be accurately correlated with the productivity of land.

#### REFERENCES

- [1] Zakharova IG Information technologies in education / IG Zakharova. - Moscow: Academy, **2003**. 192 p. ISBN 978-5-7695-6700-1 (in russian).
- [2] Obukh GG The method of teaching geography / G. G. Obukh. - Moscow: Universitetskoye, **2001**. 184 p. (in russian).
- [3] Novenko DV Using Geoinformation Technologies in School Geographic Education / DV Novenko // Geography in School. **2007**. No. 7. P. 36-40. ISBN: 978-5-534-00240-9 (in russian).
- [4] Makarova LN The use of technical aids in geography lessons / LN Makarova // Questions of Internet education. **2006**. No. 36. ISBN 978-5-91454-069-9 (in russian).
- [5] Altukhov AI, Nechaev V.I. Organizational and economic problems of improving the seed production of grain crops - ESKhR - №7. **2010**. P. 33-46 (in russian).
- [6] Busel IP, Malikhtarovich PI, Furs IN, Yakovchik NS Organization of production in agricultural enterprises. Moscow: IVC of the Ministry of Finance, **2012**. 576 p. ISBN 978-985-6993-95-7 (in russian).
- [7] Vodyannikov V. Organization and management of production in agricultural enterprises. - Moscow: Kolos, **2005**. 506 p. ISBN 978-985-467-628-9 (in russian).
- [8] Gataulin A.M. Mathematical modeling of economic processes in agriculture. - Moscow: ITK Granit, **2009**. 432 p. ISBN 5-699-15370-5 (in russian).
- [9] <https://www.geoscan.aero/en/> (in russian).
- [10] Khasanshina N. 3. Geoinformation technologies as a means of integrating knowledge in informatics and geography / N. 3. Khasanshina // Information Technologies of Education-2002 / Section II / Subsection 3 (Information Technologies of Teaching). ISBN 978-9965-03-246-7 (in russian).

УДК 004:04 338

**Ж.Е.Кенжебаева**

АО «Финансовая Академия», г.Астана, Казахстан

#### ГЕОИНФОРМАЦИОННЫЕ ТЕХНОЛОГИИ В РАЗЛИЧНЫХ СИСТЕМАХ

**Аннотация.** В данной статье рассматриваются геоинформационные системы в различных отраслях образования и промышленности. ГИС-технологии являются эффективным средством в создании демонстрационно-методического материала и электронных пособий для выполнения лабораторных работ, для добычи полезных ископаемых, в поиске наиболее благоприятных урожайных мест для аграрного сектора экономики и т.д. Так, поиск полезных ископаемых начинается со сравнения спутниковых снимков с полученными ранее геологическими картами об исследуемой территории Земли. Так же современные информационные технологии стали одним из основных элементов новых областей ресурсосберегающего направления в области сельскохозяйственной культуры. Таким образом, высокая степень информатизации общества способствует активному внедрению и использованию информационных технологий, как в систему образования, так и в бизнес.

**Ключевые слова:** информационные технологии, система, география, карты, образование, добыча, отрасль.

ӨОК 004:04:338

**Ж.Е.Кенжебаева**

«Қаржы академиясы» АҚ, Астана, Қазақстан

#### ТҮРЛІ ЖҮЙЕЛЕРДЕГІ ГЕОИНФОРМАЦИОНДЫҚ ТЕХНОЛОГИЯЛАР

**Аннотация.** Бұл мақалада білім беру мен өнеркәсіптің түрлі салаларында геоақпараттық жүйелер қарастырылады. ГАЗ-технологиялар - зертханалық жұмыстарды орындауға, тау-кен өндіруге, экономиканың агроөнеркәсіп секторына қолайлы егін жинау орындарын табуға және т.б. көрсету үшін демонстрациялық материалдар мен электронды нұсқаулықтарды жасаудың тиімді құралы. Осылайша, минералды іздеу ғарыштық суретті Жердің зерттелген аумағында бұрын алынған геологиялық карталармен салыстырудан басталады. Сондай-ақ, заманауи ақпараттық технологиялар ауылшаруашылық дақылдары саласындағы ресурстарды үнемдеу бағытының жаңа бағыттарының негізгі элементтерінің бірі болды. Осылайша, қоғамды ақпараттандырудың жоғары дәрежесі білім беру жүйесінде де, бизнесте де ақпараттық технологияларды белсенді енгізуге және пайдалануға мүмкіндік береді.

**Түйін сөздер:** ақпараттық технологиялар, жүйе, география, карталар, білім, өндіріс, өнеркәсіп.

#### Information about the authors:

Kenzhebayeva Zh.E. - <https://orcid.org/0000-0002-1942-4474>



## МАЗМҰНЫ

### Техникалық ғылымдар

<i>Ахметов Б., Гнатюк С., Жмурко Т., Кинзерявий В., Юбузова Х.</i> Шуы бар кванттық арнада қауіпсіздік байланыстың детерминистикалық хаттама жұмысының имитациялық үлгісінің эксперименттік зерттеулер.....	5
<i>Усольцева Г.А., Әкбаров М.С., Акчил А., Яркова А.А.</i> Құрамында қалайы бар электролитті қожды физико-химиялық талдау.....	11
<i>Кенжебаева Ж.Е.</i> Түрлі жүйелердегі геоинформациондық технологиялар.....	20

### Биология ғылымдар

<i>Кершанская О.И.</i> Қазақстанда ауылшаруашылығы дақылдарының элиталы сорттарын құрастыру үшін CRISPR/CAS9 геномын редакциялаудың жаңа революциялық биотехнологиясы.....	24
--	----

### Аграрлық ғылымдар

<i>Әбуғалиев С.Қ., Сейдәлиев Н.Б., Дәлібаев Е.К., Жамалов Б.С., Муқа Ш.Б.</i> Сүтті сиыр шаруашылығында тапсырыспен шағылыстыруды және геномдық талдауды ұйымдастыру.....	41
---	----

### Қоғамдық ғылымдар

<i>Әмірбекұлы Е., М. Ф. Грела., Тазабекова А.</i> Кәсіпкерлік Алматы қаласының бәсекелестікке қабілеттілігінің факторы ретінде.....	48
<i>Абуов К.К., Абдильдинова Н.Е., Галиева А.Х.</i> Солтүстік Қазақстанның ауыл шаруашылық еңбек нарығын қалыптастыру және дамыту (Ақмола облысының мысалында).....	56
<i>Аюпова З.К., Құсайынов Д.Ө.</i> Қазақстан республикасындағы мемлекеттік пен құқықтың қалыптасу ерекшеліктері.....	61
<i>Бижанов Д.Т., Нургабылов М.Н., Абдрахманова Р.С., Дошан А.С.</i> Отын үнемді қауіпсіздік және еліміздің энергетикалық ресурстарды мәселелері.....	66
<i>Буткенова А.К.</i> Өнеркәсіптік кәсіпорында адам капиталды дамытудың мониторингі.....	73
<i>Ескалиева А. Ж., Дарискалиева М.С., Канатова А.Ж.</i> Адам капиталының сапасын қысқасының перспективалары..	78
<i>Иғалиева Л.Н.</i> Аймақтағы әлеуметтік-экономикалық дамуды және экологиялық қауіпсіздікті қамтамасыз етілуді бағалау (Атырау облысы мысалында).....	82
<i>Ищанова Р.К.</i> Мемлекеттің қаржылық жүйесінің құрылысы мемлекеттік бюджеті.....	89
<i>Панзабекова А.Ж., Мұсаева Д.М., Жанбозова А.Б.</i> Ақпараттық қоғамның тұрғындардың өмір сүру сапасына әсері тұрғысынан қалыптасуы мен дамуы.....	94
<i>Сабирова Р.К., Адиева Э.М., Бисембиева Ж.К.</i> Қазақстанның мемлекеттік бюджеті: қаржы және пайдалану Мәселелері.....	100
<i>Тлесова Э., Хойч А., Кураш Н.</i> Орталық азия мемлекеттерінің экономикасы.....	104
<i>Туякова А.Е.</i> «Рухани жаңғыру» бағдарламасындағы патриотизмні Қазақстандық даму тарихы факторы ретінде қалыптастыру.....	111

## СОДЕРЖАНИЕ

## Технические науки

<i>Ахметов Б., Гнатюк С., Жмурко Т., Кинзерявий В., Юбузова Х.</i> Экспериментальные исследования имитационной модели работы детерминистического протокола безопасной связи в квантовом канале с шумом.....	5
<i>Усольцева Г.А., Акбаров М.С., Акчил А., Яркова А.А.</i> Физико-химический анализ электролитического оловосодержащего шлама .....	11
<i>Кенжебаева Ж.Е.</i> Геоинформационные технологии в различных системах.....	20

## Биологические науки

<i>Кершанская О.И.</i> Новая революционная биотехнология редактирования генома CRISPR/CAS9 для создания элитных сортов сельскохозяйственных культур в Казахстане.....	24
---	----

## Аграрные науки

<i>Абугалиев С.К., Сейдалиев Н.Б., Далибаев Е.К., Жамалов Б.С., Муқа Ш.Б.</i> Организация проведения заказного спаривания и геномного анализа бычков в молочном скотоводстве.....	41
---	----

## Общественные науки

<i>Әмірбекұлы Е., М. Ф. Грела, Тазабекова А.</i> Предпринимательство как фактор роста конкурентоспособности г. Алматы.....	48
<i>Абуов К.К., Абдильдинова Н.Е., Галиева А.Х.</i> Формирование и развитие аграрного рынка труда в северном Казахстане (на примере Акмолинской области).....	56
<i>Аюпова З.К., Кусаинов Д.У.</i> Особенности формирования государственности и права в республике Казахстан.....	61
<i>Бижанов Д.Т., Нургабылов М.Н., Абдрахманова Р.С., Дошан А.С.</i> Проблемы экономической безопасности топливно-энергетических ресурсов страны.....	66
<i>Буткенова А.К.</i> Мониторинг развития человеческого капитала на промышленных предприятия.....	73
<i>Ескалиева А. Ж., Дарискалиева М.С., Канатова А.Ж.</i> Перспективы усиления качества человеческого капитала.....	78
<i>Игалиева Л.Н.</i> Оценка социально-экономического развития и обеспечения экологической безопасности региона (на примере Атырауской области).....	82
<i>Ищанова Р.К.</i> Государственный бюджет как ведущее звено финансовой системы государства.....	89
<i>Панзабекова А.Ж., Мусаева Д.М., Жанбозова А.Б.</i> Формирование и развитие информационного общества в контексте его влияния на качество жизни населения.....	94
<i>Сабирова Р.К., Адиетова Э.М., Бисембиева Ж.К.</i> Государственный бюджет Казахстана: проблемы финансирования и использования.....	100
<i>Тлесова Э., Хойч А., Кураш Н.</i> Экономика центрально-азиатских стран.....	105
<i>Туякова А.Е.</i> Формирование патриотизма в рамках программы «Рухани жаңғыру» как исторический фактор развития Казахстана.....	111

## CONTENTS

### Technical sciences

<i>Akhmetov B., Gnatyuk S., Zhmurko T., Kinzeryayvy V., Yubuzova Kh.</i> Experimental research of the simulation model for deterministic secure communication protocol in quantum channel with noise.....	5
<i>Ussoltseva G., Akbarov M., Akchil A., Yarkova A.</i> Physico-chemical analysis of a tin-containing electrolytic slime.....	12
<i>Kenzhebayeva Zh.E.</i> Geoinformation technologies in various systems.....	20

### Biological sciences

<i>Kershanskaya O.I.</i> New breakthrough CRISPR/CAS9 biotechnology of genome editing for creation of elite crops in Kazakhstan.....	24
--	----

### Agrarian science

<i>Abugaliyev S.K., Seydaliyev N.B., Dalibayev E.K., Zhamalov B.S., Muka Sh.B.</i> Procedure of custom mating and genomic analysis of bull-calves in dairy cattle breeding.....	41
---	----

### Social sciences

<i>Amirbekuly Ye., Manuel Fernandez Grela, Tazabekova A.</i> Entrepreneurship as a driver of competitiveness of the city of Almaty .....	48
<i>Abuov K.K., Abdildinova N.E., Galiyeva A. K.</i> Formation and development of the agrarian labor market in northern Kazakhstan (on the example of the Akmola region).....	56
<i>Ayupova Z.K., Kussainov D.U.</i> Features of formation of statehood and law in the republic of Kazakhstan.....	61
<i>Bizhanov D.T., Nurgabylov M.N., Abdrakhmanova R.S., Doshan A.S.</i> Problems of economic security of the fuel and energy resources of the country.....	66
<i>Butkenova A.K.</i> Monitoring of human capital development in industrial enterprises.....	73
<i>Eskalieva A.Zh., Dariskalieva M.S., Kanatova A.Zh.</i> Prospects for strengthening the quality of human capital.....	78
<i>Igaliyeva L.N.</i> Assessment of socio-economic development and environmental security of the region (on the example of Atyrau region).....	82
<i>Ichshanova R.K.</i> State budget as the leading link of the financial system of the state.....	89
<i>Panzabekova A.Zh., Mussayeva D.M., Zhanbozova A.B.</i> Formation and development of information society in the context of its impact on quality of population life.....	94
<i>Sabirova R.K., Adietova E.M., Bisembieva Zh.K.</i> State budget of Kazakhstan: problems of financing and use.....	100
<i>Tlessova E., Khoich A., Kurash N.</i> Economy of central asian countries.....	105
<i>Tuyakova A.E</i> Formation of patriotism in the framework of the program " ruhani zhangyru " as a historical factor of the development of Kazakhstan.....	111

---

---

**Publication Ethics and Publication Malpractice  
in the journals of the National Academy of Sciences of the Republic of Kazakhstan**

For information on Ethics in publishing and Ethical guidelines for journal publication see <http://www.elsevier.com/publishingethics> and <http://www.elsevier.com/journal-authors/ethics>.

Submission of an article to the National Academy of Sciences of the Republic of Kazakhstan implies that the work described has not been published previously (except in the form of an abstract or as part of a published lecture or academic thesis or as an electronic preprint, see <http://www.elsevier.com/postingpolicy>), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, it will not be published elsewhere in the same form, in English or in any other language, including electronically without the written consent of the copyright-holder. In particular, translations into English of papers already published in another language are not accepted.

No other forms of scientific misconduct are allowed, such as plagiarism, falsification, fraudulent data, incorrect interpretation of other works, incorrect citations, etc. The National Academy of Sciences of the Republic of Kazakhstan follows the Code of Conduct of the Committee on Publication Ethics (COPE), and follows the COPE Flowcharts for Resolving Cases of Suspected Misconduct ([http://publicationethics.org/files/u2/New\\_Code.pdf](http://publicationethics.org/files/u2/New_Code.pdf)). To verify originality, your article may be checked by the originality detection service Cross Check <http://www.elsevier.com/editors/plagdetect>.

The authors are obliged to participate in peer review process and be ready to provide corrections, clarifications, retractions and apologies when needed. All authors of a paper should have significantly contributed to the research.

The reviewers should provide objective judgments and should point out relevant published works which are not yet cited. Reviewed articles should be treated confidentially. The reviewers will be chosen in such a way that there is no conflict of interests with respect to the research, the authors and/or the research funders.

The editors have complete responsibility and authority to reject or accept a paper, and they will only accept a paper when reasonably certain. They will preserve anonymity of reviewers and promote publication of corrections, clarifications, retractions and apologies when needed. The acceptance of a paper automatically implies the copyright transfer to the National Academy of sciences of the Republic of Kazakhstan.

The Editorial Board of the National Academy of sciences of the Republic of Kazakhstan will monitor and safeguard publishing ethics.

Правила оформления статьи для публикации в журнале смотреть на сайте:

[www.nauka-nanrk.kz](http://www.nauka-nanrk.kz)

**ISSN 2518-1483 (Online), ISSN 2224-5227 (Print)**

<http://www.reports-science.kz/index.php/ru/>

Редакторы *М. С. Ахметова, Т.А. Апендиев, Аленов Д.С.*  
Верстка на компьютере *А.М. Кульгинбаевой*

Подписано в печать 13.10.2018.  
Формат 60x881/8. Бумага офсетная. Печать – ризограф.  
7 п.л. Тираж 500. Заказ 5.