

**GEODEZY AND MINE SURVEY**

**STATE OF THE PROBLEM OF COMPLEX STUDYING OF MODERN  
GEODYNAMICS OF SIBERIA IN THE LATE TWENTIETH CENTURY**

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The brief review of development of comprehensive researches of modern geodynamics of Siberia, executed in the second half of the twentieth century is given.

**Key words:** geodynamic phenomena, geometrical leveling, modern vertical movements of an earth's crust, geodynamic sites, modern deformations of a terrestrial surface.

**COMPLEX INSPECTION OF HYDRAULIC ENGINEERING  
CONSTRUCTIONS ON THE CHARDARIN RESERVOIR**

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The assessment of technical condition and development of recommendations about ensuring operational suitability of construction designs and the basis of hydraulic engineering constructions was carried out on developed by authors of a technique with use of modern ways and innovative technologies.

**Key words:** researches, hydraulic engineering constructions, hydrography, electronic tacheometer, geotomograph, deformations.

## **MAPPING AND ASSESSMENT OF RECREATIONAL USE OF LANDSCAPE AND AESTHETIC RESOURCES IN THE UVSNURSKY AIMAG**

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The article presents the use of mapping and landscape and aesthetic methods using in the assessment of recreational opportunities of natural resources. The study include recreation-tional opportunities offered range of ten criteria, most fully reflects the diversity of the landscape-ing represented in UVS aimag of Mongolia.

**Key words:** mapping, recreational use, landscape, criteria.

## **THE PRELIMINARY RESULTS OF THE GNSS-OBSERVATIONS ON POINTS OF GEODETIC NETWORK IN THE NORTHERN REGION OF UKRAINE**

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The preliminary results of the coordinates accuracy study in the northern region of Ukraine using GNSS-observations are presented. A comparative analysis of the observations quality using software GrafNav / GrafNet and domestic software OCTAVA is provided. The possibility of obtaining the coordinates with the required accuracy for solving the land registry with using for processing of domestic software is confirmed.

**Key words:** GNSS-observations, land cadastral reform, accuracy, permanent reference stations.

## **SIMPLIFIED ALGORITHM ESTIMATED TIME AND AZIMUTH-SUNRISE SUNSET POINT OF LIGHT**

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The article describes a simplified algorithm for computing the time, and azimuth of sunrise-sunset points luminaries. The traditional algorithm was created at a time when the main computational tool is a table in which the arguments of trigonometric functions (angle values) were given in the range of 0 to 90°. Therefore, when calculating inverse trigonometric functions, for example such as arccos had to take into account the additional conditions, making it difficult to calculate. With the help of modern computer technology can uniquely receive arccos ranging from 0 to 180°, and this simplifies the calculation.

**Key words:** algorithm computation, times and azimuths points of sunrise and sunset.

## **LAND MANAGEMENT, CADASTRE AND LAND MONITORING**

### **IMPROVEMENT OF MUNICIPAL LAND CONTROL EFFICIENCY**

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Recommendations on improving municipal land control at the present stage are given. The authors substantiate the necessity of analyzing the problems arising in process of land control, and offer the ways to solve them. Basic types of law violation in the field of municipal land control are presented. Main characteristics of municipal land control efficiency monitoring on the territory of the municipal unit are shown. The necessity of GIS technologies application for municipal land control is emphasized.

**Key words:** municipal land control, land unit, municipal unit, municipal inspector.

## **CADASTRAL ENGINEER`S LIABILITY FOR IMPROPER EXECUTION OF CADASTRAL WORKS CONTRACT**

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The research is about the liability of cadastral engineer that comes as a result of improper execution of cadastral works contract. The research reviews kinds of liability and guarantees of contract proper execution.

**Key words:** cadastral engineer, cadastral works contract.

## **ON THE PRIORITIES INDICATORS OF SUSTAINABLE DEVELOPMENT AREAS**

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Priority system for territories ecologically sustainable development indices is considered. The concept of higher priority for ecological indices of clean primary production is offered. Natural indicators of environmental pollution have a local character. Economic and social indicators are oriented at ecological ones.

**Key words:** sustainable development, indices of development, biodiversity, clean primary production, ecosystem efficiency, natural resources.

## **LAND AND PROPERTY ASPECTS OF THE ENTERPRISE ENERGY (CASE STUDY ENERGY CITY OF NOVOSIBIRSK)**

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The article deals with the problematic issues of management of land and property of an enterprise fuel energy.

**Key words:** land and property complex of sanitary protection zones, security zones, land.

## **ON CADASTRE REAL ESTATE IN GERMANY**

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A model of the cadastre of real estate in Germany, the procedure for entering data in the real estate cadastre and registration of rights. The role of notaries and cadastral engineers in conducting an inventory of the level of their responsibilities and requirements and skill requirements. Given legal acts regulating the sphere of the real estate cadastre and registration of rights.

**Key words:** real estate cadastre, land, Land Records, registration rights, trade.

## **OPTICS, OPTOELECTRONIC DEVICES AND COMPLEXESS**

### **ANALYSIS OF MODERN METHODS OF INVESTIGATION OF SURFACE ROUGHNESS**

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Has been widely developed methods using laser interferometry in global engineering allow to measure with high temporal and spatial resolution of surface roughness required to control the quality of parts used in special engineering. Methods based on laser interferometry are rarely used in domestic experimental facilities, their feasibility and limitations of poorly studied, ready

equipment industry does not produce. This paper presents an overview and systematic analysis of modern methods of control of surface roughness. It is proposed to give special attention to optical interferometry as the most promising methods in the study of surface roughness.

**Key words:** surface roughness, interferometric measurements, profillograf, laser ellipsometer.

## **PHOTON MIRROR TERAJET FORMATION**

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It was been shown that the photonic jet can be formed by dielectric particles in the "reflection" mode. So far, in the literature the formation of photonic jets by dielectric particles were investigated in the "transmissive" mode. Examples of numerical simulation of the formation of the photonic terajets by particles located on a reflecting substrate, as in the radiation incident normal to the surface, and an angle are discussed. It has been shown that by choosing the geometry of the particles can be adjusted parameters, the shape and position of the photonic jet in the space.

**Key words:** photonic nanojet, terajet, numerical simulation, mirror, the wave front, the dielectric structure.

## **COMPLEX COAXIAL RESONATORS ON THE BASIS OF PSEUDO SPHERE LOBACHEVSKY**

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In the article the analysis of complex, high-frequency filters on the basis of pseudo far Lobachevsky, the principle of which is based on the resonance amplification of electromagnetic field with subsequent rapid conclusion of energy in the form of powerful nanosecond microwave pulses. The results of the research work, data filters, it is proved that the settings of these filters

have increased steepness of slopes frequency response, low-loss, wide suppression spurious harmonics.

**Key words:** high-frequency filters, microwave, pseudosphere Lobachevsky.

## **PHOTON TERAJET FORMATION FROM THE DIELECTRIC PARTICLES WITHOUT AXIAL SPATIAL SYMMETRY FORMS**

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At the first time in THz bandwidth it has been shown that the photonic jet can be formed by dielectric particle having no axial symmetry of the spatial form. Examples of numerical simulation photonic terajets formation from the particles in the form of an axisymmetric cone, a pyramid, a bar with a triangular profile are discussed. It is shown that by selecting of particle shape the parameters and the shape of the photon jet can be adjusted.

**Key words:** photonic nanojet, terajet, numerical simulation, the wave front, the dielectric structure.

## **CARTOGRAPHY AND GEOINFORMATICS**

### **REFLECTING THE SPACE CURVES ON THE GIVEN PLAIN WHEN SOLVING TASKS OF APPLIED GEOINFORMATICS**

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The purpose of studying systems in applied geoinformatics is defining their state in space and in time, i. e. their form, dimensions and their location in space as functions of time. The form and the dimensions of a system are defined by the border by which it is divided from the environment. The geometrical image of such a border is made up by lines and surfaces, whereas the tasks which may arise here are quite varied. One of the tasks is reflecting the borders of the systems on a given plain. In applied geoinformatics and in cartography the tasks of this kind are solved by means of depicting the relief of the physical fields of the Earth on a plain (the Earth surface relief, the fields of the gravity anomalia, the magnetic field, the temperature field and others). Generally the border of the system is defined either by the

multitude of points which belong to it or by some functional dependence. The present work studies the ways of reflecting the linear borders of systems in their parallel or central projection on the given surface.

**Key words:** the central projection, the parallel projection, the orthogonal projection, the direction of projection orth vector, the plain of projection.

## **TO THE QUESTION OF FORMALIZATION OF CARTOGRAPHICAL IMAGES**

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In article the general questions of modern cartography, in particular, in the theory of formalization of the cartographical image are considered. It is shown that the cartography and GIS passed all stages of development of figurative-symbolic models. The problem of the digital mapping integrated with GIS is characterized. Some directions of research in the theory of formal cartography are allocated.

**Key words:** theory of cartographical display, cartographical images, formal cartography, multilarge-scale cards.

## **MAKING OF INFORMATIONAL SCIENTIFIC ANALYTIC GIS-ATLAS**

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This article deals with different types of electronic atlases and marks its functional features, which are increasing with the increasing classification number. The purpose of designed GIS-atlas is defined as: scientific and reference with the capability to perform analytic operations. The definition of such atlas is given. Standard stages of making such an atlas are described.

**Key words:** map, electronic atlas, GIS-atlas, atlas informational system.

## **NEW APPROACH TO FORMING OF SYMBOLS IN THE ENVIRONMENT OF GIS**



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In article problems in modern development of cartography as sciences and production spheres are considered. Attempt to prove was made that the symbolism is one of important properties of the card, arguments on preservation of a symbolism of cartographical production are given. The solution of formalization of creation of cards in the environment of GIS on the example of thematic cards is considered. The solution on further development of cartography from the point of view of symbols is proposed.

**Key words:** neogeography, paradigm change, basic sign, formalization.

## **METHODOLOGY OF RESEARCH**

### **RECOGNITION OF SCIENTIFIC EPISTEMOLOGICAL PLAUSIBLE REASONING**

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Standard that defines the content of the reports of scientific research (R & D) does not reflect the principles (laws) of sufficient reason. 16 forms suggested to explain the principle of sufficient reason structure of scientific theory on the original set of objects, of which takes an object of scientific and practical study; on the initial set of laws from which items are accepted scientific and practical study and four paragraphs of proposals aimed at the construction of hypotheses of the study, the organization of research programs, the development of the psychological perception of the new text and the formation of the findings, conclusions and recommendations. The matrix implication reveals the analytical capabilities of R & D; equivalence reveals the equivalence priori and a posteriori knowledge. For the formation of the findings, conclusions and recommendations of the research identified logical structure: existence, disjunction, conjunction, negation on synthetic narrative.

**Key words:** law of sufficient reason, epistemology plausible reasoning, hypothesis, structuralism, a priori, a posteriori, the conclusion, the conclusion recommendations.

### **ELECTROMAGNETIC INFORMATION APPROACH TO THE COMPLETE NATURAL-SCIENCE PICTURE OF THE MATERIAL**

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Evolution of a matter from emergence of atoms, molecules, various difficult chemical and physical forms and structures in a flesh to planets, stars, etc. is based on the attributive information based on effect of modulation of a magnetic field and existence of uniform material electromagnetic system in shape quadrupole (dual electric and magnetic dipoles) at all levels of its organization.

From this it follows that integrity of a surrounding material world is based on the electromagnetic environment of attributive character. Living cell and its evolution to verbal information system is caused by emergence of macromolecules of DNA and RNA which it is information provided allocation and evolution of a cage as the open closed live information system. Today it is proved that all cellular structures at the molecular level cope constantly operating electromagnetic fields of various nature and intensity. At the molecular level specific differences of forms structures of chemical elements, i.e. a molecule of one element from another start being observed. Thus, allocation of a live matter from the lifeless happened at the cellular molecular information level which further evolution on the basis of chromosomal structures of a cage led to emergence of verbal information. The live matter is the new emergzhentny information property of a lifeless matter caused by emergence in the Installed new molecular power information system of a cage on the basis of molecules of DNA, RNA and proteins.

**Key words:** matter, integrity, evolution, electromagnetic radiation, attributive and verbal information, molecule.

## **PROFESSIONAL EDUCATION**

### **V INTERNATIONAL SUMMER STUDENT SEMINAR «3S-2014»**

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The review of the actions that took place at Wuhan University within the XI International ISPRS Summer School and V International Scientific Seminar of Young Scientists and Graduate Students «3S-2014» is presented in the article. The role of these actions for motivation of participants to deep studying of a subject, independent and conscious development of professional competences is shown.

**Key words:** research work, summer school, professional development.

## **PROFESSOR K. L. PROVOROV AND HIS CONTRIBUTION TO ESTABLISHMENT OF GEODETIC EDUCATION SCHOOL IN SIBERIA**

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The author, a pupil of K. L. Provorov (1909–1992) and, later, his colleague, states the main life landmarks of this prominent Russian scientist, a teacher and a geodesist. The scientist made a great contribution to global geodetic works in Soviet Asia, to the research of accuracy and modernization of basic geodetic networks of the country, development of higher geodetic education as a rector of the Institute of Geodesy (1955–1970), and to the establishment of Siberian scientific geodetic school, presented by A. I. Agroskin, A. A. Vizgin, V. V. Buzuk, A. N. Gridchin, D. A. Kuleshov, V. K. Pankrushin, V. A., Merkushev, V. F. Chernikov and V. G. Konusov. These prominent people made up great intellectual potential demanded up to now.

**Key words:** geodetic science, global geodetic works, triangulation, leveling, territories mapping, topographic maps, higher education, academic degrees and ranks.