



Scientific Achievements

- The University houses 68 research laboratories equipped with modern devices, such as multiprobe microscopes, powerful nuclear microscopes, X-ray diffractometers, etc.
- Research is done on 11 complex research programs.
- In 2012 there were run over 150 research projects, of which 56 were carried out at the expense of the general fund of the state budget for public programs; 46 were funded by international grants; 36 were supported by surplus funds.
- There have been established new principles of cartography to draw up a new series of specialized maps.
- There have been developed new methods of mathematical modeling of efficient thermoelastic properties, efficient conductivity and methods for producing multi-component medium that absorbs liquids at geological faults of the internal steam pressure; there has also been designed software for laboratory simulation of large neutron nests ($\approx 100,000$ neurons) through which the phenomenon of synchronization characteristic of Parkinson's disease was analyzed.
- There has been investigated the phenomenon of xero-ferritic resonator mode splitting under the influence of external magnetic fields in the range of 75-100 GHz.
- There has been built unique equipment to investigate the methods of matches in the study of direct radiation in nuclear reactions. The equipment consists of "Vector" and modules designed by university scientists.
- There have been devised several methods for solving urgent problems of social and economic development of Ukraine.
- There has been set up a sociological database of social inequalities and value orientations in Ukrainian society, which is a means for studying regularities and patterns of social relationships.
- There has been compiled a multilingual glossary of military field conversion and management.
- There have been laid down methodological and theoretical principles of geophysical tomography.
- New types of fluorescent labels have been systemized, studied, and brought to research. They form radiometric response to polarity change and hydration of the environment.



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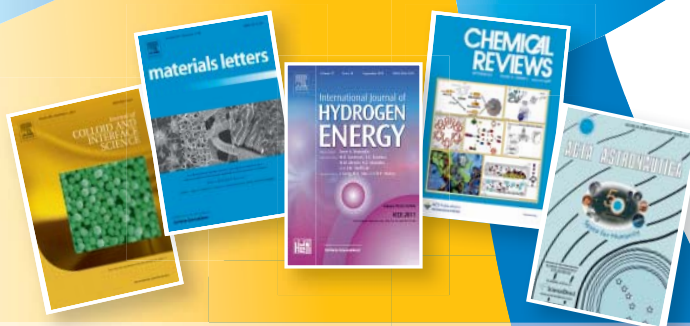


- There have been developed methods for the synthesis of new sulfolan derivatives containing modified maleinimides.
- With sol-gel technology employed, semiconductor oxides materials have been obtained and optimized as to the synthesis of gas sensitive nanoscale materials layer of semiconductor sensor absorption which contains tin dioxides and antimony components.
- There have been obtained numerous solid phase analytical reagents that contain silica and organic dyes or heteropolicomplexes for determining barbiturates in urine, labile forms of Cu (II), Zn (II), Ni (II) in soils, and for quantitative removal of Pt (II) and Pd (II) from dilute solutions.
- There have been optimized manufacturing processes of fireproof porous silicon and porous silicon.
- There have been devised methods of structural bioinformatics to develop new drugs.
- There has been experimented obtaining nanocomposite films that contain nanocluster Si in diametric matrix SiO₂ by inno-plasma decay.
- There has been defined artistic and aesthetic nature of Shevchenko's skill; there has also been analyzed verbalization of sensor prototypes in the poetic language of the writer.
- There has been studied the current state of "Ukraine-Europe" language contacts, and the prospects of their development have been outlined.

University scientists' research work is represented at annual scientific congresses, conferences, and round table talks, which made over 150 events in 2011 along with 36 international, 10 national conferences, and 8 conferences of young scientists.

Scientists and university teachers publish over 250 monographs, 400 manuals, and 7 500 research papers annually.

University scholar publication index makes over 1 000 scientific papers a year in foreign journals.



- Litvinenko, S., Garrone, E., Barbier, D., Alekseev, S., Lysenko, V., Venturello, A., Geobaldo, F., Skryshevsky, V. Hydrogen production from nano-porous Si powder formed by stain etching, (2011), *International Journal of Hydrogen Energy*, 35 (13), pp. 6773-6778. **(Impact= 4,4)**
- Serdiuk, T., Lysenko, V., Alekseev, S., Skryshevsky, V.A. Size tuning of luminescent silicon nanoparticles with meso-porous silicon membranes, (2011) *Journal of Colloid and Interface Science*, 364 (1), pp. 65-70. **(Impact= 3,27)**
- Serdiuk, T., Skryshevsky, V.A., Ivanov, I.I., Lysenko, V. Storage of luminescent nanoparticles in porous silicon: Toward a solid state "golden fleece", (2011) *Materials Letters*, 65 (15-16), pp. 2514-2517. **(Impact= 2,3)**
- Oleksandr O. Grygorenko, Dmytro S. Radchenko, Dmitriy M. Volochnyuk, Andrey A. Tolmachev, and Igor V. Komarov. Bicyclic Conformationally Restricted Diamines. *Chem. Rev.*, 2011, 111 (9), pp 5506-5568 **(Impact= 40.197)**
- Vladimir S. Yarmolchuk, Ivan L. Mukan, Oleksandr O. Grygorenko, Andrey A. Tolmachev, Svitlana V. Shishkina, Oleg V. Shishkin, and Igor V. Komarov An Entry into Hexahydro-2H-thieno[2,3-c]pyrrole 1,1-Dioxide Derivatives. *J. Org. Chem.*, 2011, 76 (17), pp 7010-7016. **(Impact= 4.45)**
- Pavel K. Mykhailiuk, Svetlana V. Shishkina, Oleg V. Shishkin, Olga A. Zaporozhets, Igor V. Komarov. Exploiting morph-DAST mediated ring-expansion of substituted cyclic β -amino alcohols for the preparation of cyclic fluorinated amino acids. Synthesis of 5-fluoromethylproline and 5-fluoropipecolic acid. *Tetrahedron* 2011, 67, 3091-3097. **(Impact= 3.06)**
- Oleksii M. Kharytonov, Boris M. Kiforenko. Finite-thrust optimization of interplanetary transfers of space vehicle with bimodal nuclear thermal propulsion, (2011), *Acta Astronautica* 69 223-233

