

CURRENT DEVELOPMENTS AND DIRECTIONS OF THE NATIONAL ACADEMY OF SCIENCES OF BELARUS

B.I.STEPANOV INSTITUTE OF PHYSICS

F.Skaryny Ave., 70
220072 Minsk
Republic of Belarus
Fax 0037517 2840879
kuzmin@ifanbel.bas-net.by

- Physics of laser and laser technologies, including application of lasers in industry, biology and medicine
- Soliton theory
- Laser-plasmic complex for adjustment of prospective high frequency plasmochemistry technologies
- Plant for measuring of energy and time characteristics
- Laser and magnetic laser therapeutic settings for medicine and veterinary needs

UNITED INSTITUTE OF INFORMATICS

Surganova St., 6
220012 Minsk
Republic of Belarus
Fax 0037517 2842175
itekan@newman.basnet.minsk.by

- Development of patterns of complex systems of the real world – technologies, artificial objects, ecosystems, social systems
- Processing of air and space photography and information, production of digital maps of territories, superconductive calculation and geoinformation systems
- Development of patterns of intellectual processes in management, industry and medicine, development of electronic expert systems with reasonable thinking
- Management and theory of decision-making
- Information security
- Geoinformation and cartographical systems and complexes
- Automatic design systems (CAD/CAM/CAE)

- Automatic cartography
- Operations study and discrete optimization
- Development of decision-making patterns in extreme conditions
- Biomedical information systems
- Development both realization of algorithms of processing and analysis of the images for parallel architecture
- Information input and output technologies in the computing systems, information computing systems, identification systems
- Recognition both interpretation of objects and phenomena on space snapshots on the basis of use of the integrated object-oriented models of representation of the data of the various resolution, bases of knowledge and algorithms of the logic analysis
- Transformation of speech to the text and text in speech, processing of signals, images, speech and text
- Joint development and edition of the linguistic dictionary of a new type
- Development of the police search system of a video registration of certain categories of people for the criminal divisions and control
- Programmes and systems for industrial process automation: images processing, introduction of multifunctional multichannel modems
- Systems of realization of auto-human interface on surface, 3d space and virtual reality
- Systems of diagnostics, management and control of technology process
- Technology and programmes for creation of information and telecommunication systems
- Computing technologies for designing and production in mechanical engineering and instrument-making
- Multimedia technologies
- Programme of choice of interbank transfer clearing option
- Family of highly productive computation systems with parallel

architecture (supercomputers) and applied programming and hardware controlled complex based on it.

- Solar batteries of new generation

INSTITUTE OF ELECTRONICS

Logoyski Trakt., 22
220090 Minsk
Republic of Belarus
Fax 0037517 2652541
inel@inel.bas-net.by

- Intellectual transformers of information measuring on the basis of microelectronic and optoelectronic technologies
- Intelligent inclined metering systems

INSTITUTE OF SOLID STATE AND SEMICONDUCTORS PHYSICS

P. Brovki St., 17
220072 Minsk
Republic of Belarus
Fax 0037517 2840888
demeshko@ifttp.basnet.minsk.by

- Transformers of solar energy
- Technologies of KRTP and LBO monocrystal growing and production of nonlinear optics elements on their basis
- Contactless electrostimulation therapeutic CETA device

INSTITUTE OF MOLECULAR AND ATOM PHYSICS

F. Skaryny Ave., 70
220072 Minsk
Republic of Belarus
Fax 0037517 2840030
imafbel@imaph.bas-net.by

- Automated laser fluorescent complex for plasma diagnostics and study of consecutive reactions kinetics
- Analyzer of very-high-frequency light impulses
- Laser for photodynamics cancer therapy with support of Belarusian medication Chlorine E6
- Nanosecond absorbent spectrometer for biophysics

A.V. LYKOV HEAT AND MASS TRANSFER INSTITUTE

P. Brovki St.,15
220072 Minsk
Republic of Belarus
Fax 0037517 2322513
bulavko@ns1.hmti.ac.by

Technologies and equipment for:

- Technology and equipment for drying of materials and agricultural products
 - Highly precise polishing of surfaces
 - Plasma treatment of of diesel engines (impulse barrier discharge in in porous environment). Technology and equipment based on fluidized bed installations for burning of solid fuels and waste products
 - Purification of gas effluents
 - Recycling of worn out automobile tyres; impregnation of railway sleepers
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- Heat pipe exchanges
 - Application of thermal processes for practical medicine
 - Energy-saving technologies, diagnostics devices and methods
 - Technology of plasmic purification of diesel engine exhausts from soot and impulse barrier discharge in porous environment
 - Technologies of conversion of hydrocarbon fuel (natural gas, kerosene, diesel fuel, petrol) into hydrogen for injection
 - Technology of rising adhesivity and moistening of polymer materials surface
 - Technologies and equipment for synthesis of hydrocarbon nanotubes

PHYSICAL-TECHNICAL INSTITUTE

Kuprevich St.,4
220141 Minsk
Republic of Belarus
Fax 0037517 2637693
byeli@fiztech.belpak.minsk.by

- Technological process and automatic computerized laser complexes for heat treatment, cutting, and welding of materials
- Technology and equipment for magnet-impulse and hydro-impulse punching of materials

- Automatic complexes for cross-wedged rolling
- Body and armour materials and means of personal protection and special technics defence
- Developments in the sphere of creation of new cast iron for auto industry and new technologies
- Development of technology of durability of press-stamp instruments, precision cutters, foundry forms, with use of laser alloying and fusing
- Technological processes of target production for metallization of plates of integral microschemes of new generation
- Processes of magnetoimpulse sheet stamping of parts of complex spatial forms

METAL-POLYMER RESEARCH INSTITUTE

Kirov St., 32a
 246652 Gomel
 Republic of Belarus
 Fax 00375232 775211
 mpri@mail.ru

- Polymer-based composites including materials for tribology (self-lubricating, frictional and antifrictional), seals, heat-resistant, sound-proof, shock-resistant materials, and technological processes to produce them
- New resources-economy technologies of formation of silicate cotton plates with increased characteristics

INSTITUTE OF MACHINE RELIABILITY

Akademicheskaya St., 12
 220072 Minsk
 Republic of Belarus
 Fax 0037517 2842409
 Berest@bas25.basnet.minsk.by

- Technologies for recycling of constructive metal-based materials
- Technologies for powder coatings deposition on machine parts
- Equipment to produce bimetallic units
- Technology and equipment to deposit corrosion- and wear-resistant coatings
- Board control systems for mobile machines and railway transport

- Electromechanical transformers based on piezoceramic elements
- Study of microstructure of solid and tribology properties of oxide ceramic coatings formed by microplasmic treatment method
- Gas-thermal powdering
- Microplasmic treatment and consolidation of technology processes
- Development and introduction of coatings, mechanisms and drives on the basis of oxide ceramics with low weight and higher reliability

INSTITUTE OF POWER ENERGETIC PROBLEMS

220109 Minsk-Sosny
 Republic of Belarus
 Fax 0037517 2467055
 jakoush@sosny.bas-net.by

- Heat-exchangers to produce vapour and hot water
- Methods to control radioactive pollution resulted from nuclear bomb explosions and nuclear power station disasters
- Technology for energy production by treatment of organic waste products
- Technologies for utilisation of waste nuclear fuel and radioactive waste products, capsulating of radioactive ashes

INSTITUTE OF RADIOACTIVE PHYSICAL-CHEMICAL PROBLEMS

220109 Minsk-Sosny
 Republic of Belarus
 Fax 0037517 2467317
 rpcpi@irpcp.belpak.minsk.by

- Health risk assessmentsystem of influence of toxins and antropogenic carcinogenics that can be found in water, atmosphere and food
- Technology for radioactive sterilization of medical instruments and medicines; - technology for radioactive treatment of food stuffs
- Technologies of radiation treatment of food
- Technology and equipment to produce antifrictional material

INSTITUTE OF RADIOBIOLOGY

Kuprevich St., 2
220141 Minsk
Republic of Belarus
Fax 0037517 2642315
irb@irb.belpak.minsk.by

- Study of technogene radionuclides in various ecosystems and their components
- Study of influence of low irradiation on hormones and metabolism, organism functioning, structural and genetic changes in organs and tissues
- Study of withdrawal, distribution and accumulation of radionuclides, development of the means of exerting influence on the given processes
- Development and testing of substances and combinations with radiation protective and gene adaptive influence

INSTITUTE OF RADIOECOLOGY

F. Skaryny Ave., 70
220109 Minsk-Sosny
Republic of Belarus
Fax 0037517 2467615
irep@sosny.bas-net.by

- Development of methods to forecast the influence of radioactive pollution on the environment
- Technology for treatment of liquid radioactive waste products
- Methods for purification from radioactive waste products and methods for conservation of waste products

INSTITUTE AND CONCERN OF POWDER METALLURGY

Platonova St., 41
220071 Minsk
Republic of Belarus
Fax 0037517 2100574

- Efficient diamond-metallic compositions, performance and standard technologies of diffusive hardening and production of diamond cutting disks for dry cutting of building materials
- Diamond containing compositions of working elements fixing on steel frame of diamond front cutters (up to 450 mm in diameter) for abrasive processing of working materials

- Production of highly pellucid cores of inductive elements for radioelectronics on the basis of thermal stability materials of manganese zinc ferrite for faint and heavy magnetic fields
- Material on the basis of carbide titanium for composite coating and technologies of its coatication
- Technology of protection of high-loaded parts of hydraulic mechanisms friction by means of multicomponent materials high-speed gas-flame coating
- Powder composition material for production of cumulative charge for oil and gas reconaissance
- Development of diamond O-rings for dry drilling of building materials
- Development of diamond segmental wheels for cutting of pavements
- Ferrite cores of complicated configuration for television components
- Wearproof parts of pressure distribution in axial-plunger pumps
- Friction articles for use in energyrich nodes of non-lubricant friction
- Targets and cathods for magnetron and ion-plasma sputtering of thin films

INSTITUTE OF APPLIED PHYSICS

Akademicheskaya St.,16
 220072 Minsk
 Republic of Belarus
 Fax 0037517 2841081
 ipfanb@bas24.basnet.minsk.by

- Installations IMPOK for automatic control of heat-treatment, quality, mechanical properties and structure of sheet rolled steels
- INTROMAT complexes to control distributions of stresses and hardness in surface layers of materials and welding seams
- Systems to control consumption of petroleum-based products
- Devices of railway transport wheels and bottom-ground distance control
- Methods and means for penetrant inspection
- Portable devices to control hardness of articles

- Devices to measure coating thickness
- Devices to determine electromagnet losses and induction in steel
- Ultrasonic device for NDT cylinder sleeve of diesel engine
- Automated device for quality testing of joint between inresist insert and a base material of diesel motors pistons
- Isothermal tanks
- Sorbing material PENOPURM
- Technology for removing spills of oil and petroleum products
- Equipment and technology for manufacturing the products of polyurethane foam: dosaging and mixing facilities, presses, molds

INSTITUTE OF TECHNOLOGY OF METALS AND ALLOYS

Byalinitiski-Biroulia St.,11
 212030 Mogilev
 Republic of Belarus
 Fax 00375222 267175

- Technology for continuous horizontal casting of ferrous and non-ferrous alloys
- Technology to produce cathode tape based on copper chloride for water-activated sources of electric current
- New founding technologies of silumins getting with inverted structure
- Development of technology process of silumin getting with globular silicon
- Development of casting of deformed silumins and their hardening by means of plastic deformation (forging, pressing, stamping, flatting, extrusion)

INSTITUTE OF ENGINEERING ACOUSTICS

F.Skaryny Ave.,70
 220717 Vitebsk
 Republic of Belarus
 Fax 00375212 243953
 ipt@iptita.belpak.vitebsk.by

- Technologies to produce ceramic cutting tools and medical scalpels
- Special magnet materials for electronic devices and filters

ENGINEERING CENTRE "PLASMOTEG"

Kuprevich St., 1/3
220141 Minsk
Republic of Belarus
Fax 0037517 2635920
chekan@plasma.basnet.minsk.by

- Technology to produce high-temperature superconducting thin solid films
- Technology to produce diamond and diamond-like coatings for different applications
- Technologies to produce sensors of pressure, shock loading, temperature for gas-analysers
- Technology of "dry" laser projector lithograph
- Development of technology of putting of diamond-like carbonic coating on unit-cast sintered from titanium powder artificial mitral valves and other medical implantants
- Technology and equipment for vacuum getting by physical concretion of cathode arc plasma discharge of superhard wearproof diamond-like carbonic coverings on measuring instruments and other friction details
- Impulse plasmic accelerator with graphite cathode for machine-tool construction
- Biocompatible powder materials with diamond-like coatings and the technology of their use in production of artificial mitral valve components
- New thin-film diamond-like abrasive material for precision treatment of optics and machine-building on the basis of technology system with impulse plasmic accelerators and computer control
- Information and diagnostics systems for heavy-duty trucks

SCIENTIFIC CENTRE OF MOBILE MACHINES MECHANICS

Akademicheskaya St., 12
220072 Minsk
Republic of Belarus
Fax 0037517 2840241
root@ncpmm.bas-net.by

- Electronic systems for monitoring, control, analysis, and service of automobiles and tractors

DEPARTMENT FOR PROBLEMS OF RESOURCE CONSERVATION

Tysengauz Sq.,7
220023 Grodno
Republic of Belarus
Fax 00375152 2440393
svir@res.belpak.grodno.by

- Technology to produce glue-melts
- Technology to produce sheet thermo-deforming composites
- Technology to produce polymer-based materials for packing
- Technology of cholesterol production from meat reprocessing

AXICON

Kuprevich St.,1/2
220141 Minsk
Republic of Belarus
Fax 0037517 2632630
axicon@mail.ru

- Development of technology and equipment for precision laser perforation of holes and materials cutting
- Development of production technology of narrow-band interference filters of perfected stability
- Power supply and laser sources cooling blocks

SCIENTIFIC AND RESEARCH CENTRE OF IMPULSE PROCESSES

Platonova St.,41
220071 Minsk
Republic of Belarus
Fax 0037517 2100977

- Technologies of getting of ceramic materials from refractory powder
- Technology of getting of brass covering with increased corrosion-resistancy

SCIENTIFIC AND RESEARCH INSTITUTE OF WELDING PROCESSES

Platonova St.,12b
220071 Minsk
Republic of Belarus
Fax 0037517 2101117

- Technologies and development of ultrasound welding machines with microprocessor control for continued joining of thermal plastic materials for light industry, aircraft building etc.

- Technology of special electrodes production with use of diffusive chromium-plated wire CB-08 for welding of stainless steel
- Solution and technology of getting of ceramic flux for welding and surfacing of metals and alloys on iron basis with use of secondary raw materials
- Computerized centre for diagnostics, quality control and welding production revitalization process, advantages over European analogues
- Automated complex for spectral evaluation of chemistry solution of weldin materials on the spectrograph basis, device with charge connection and computer; advantages over European analogues
- Teaching complex with proficiency skill evaluation for specialist training on defectoscopy of roentgen and gammagraphy control of welding joints
- Complex for orbital cutting and founding

INSTITUTE OF PHYSICS AND ORGANIC CHEMISTRY

Surganova St.,13
 220072 Minsk
 Republic of Belarus
 Fax 0037517 28416797

- Highly efficient antiatherosclerosis medication Ateramin
- Angioprotecting, antiagregant, antiasthenic and other medications of new generation

INSTITUTE OF GENERAL AND INORGANIC CHEMISTRY

Surganova St.,9
 220072 Minsk
 Republic of Belarus
 Fax 0037517 2842703
 secretar@igic.bas-net.by

- Weatherproof powder paint for trimming of metallic constructions and reinforced concrete flashing for buildings
- Technology of production of chelate fibrous ionites for the water purification from cations of heavy and transient metals
- Technology of getting of up-to-date corrosion material with bioprotective characteristics for building

INSTITUTE OF CHEMISTRY OF NEW MATERIALS

Staroborisovsky Trakt.,36
220141 Minsk
Republic of Belarus
Fax 0037517 2631923

- Technology process and production of polaroid semitranslucent films
- Production of optical bleacher
- Production of grease-cooling liquid

THE UNIFIED ENTERPRISE “SCIENTIFIC INSTRUMENT-MAKING”

Kuprevich st.,1/3
220141 Minsk
Republic of Belarus
Fax 0037517 2646194
krupupnp@tut.by

- Specially developed manual jigs and devices with hydraulic drive, instruments for emergency situations
- Automated up-to-date complex for dimensional cutting of cylinders for chemistry and other enterprises
- Visual control of the airplane surface cleanness before painting
- Unique complex for the fibres analysis to length in the spinning products
- European standard plant of weight batching that provides automatic process of mass measuring of feeding wood cuttings and proportioned binding feeding into storage device for wood-shaving plates
- Electrotherapy modular complexes for realization of electrodiagnosis methods of neuromuscular system and electrotherapy

THE UNIFIED ENTERPRISE “DIATECH”

Akademicheskaya St.,16
220072 Minsk
Republic of Belarus
Fax 0037517 2841740
kulagin@iaph.bas-net.by

- The complex of facilities for testing the mechanical properties of the sheet rolled products
- Design and production of new type of elements of integral circuits (ICs) is based on the features of punch-through effect

**INSTITUTE FOR PROBLEMS
OF NATURAL RESOURCES USE AND ECOLOGY**

StaroborISOvsky Trakt.,10
220141 Minsk
Republic of Belarus
Fax 0037517 2642413
ikonikov@ns.ecology.ac.by

- Physics basics of forecasting the climate fluctuations (droughts, floods, cold and hot winters)
- Peat sorbent of petroleum
- Technology of sorbent production of heavy metals for water effluents
- Technology of production of composition fuel on the peat basis with wastes of combustible dispersed materials
- Development of climate programmes

THE UNIFIED ENTERPRISE “DIAGNOSTICS”

Akademicheskaya.,28
220072 Minsk
Republic of Belarus
Fax 0037517 2841773

- Devices for humidity revelation and place of moisture accumulation in airplane radar cowls
- Devices for measuring of applied tensions in building constructions
- Detectors of inflammables for oil storages

PHYSIOLOGY INSTITUTE

- Physiological heat regulation mechanisms

INSTITUTE OF BIOCHEMISTRY

Leninski Komsomol blvd.,50
230017 Grodno
Republic of Belarus
Fax 00375152 334121

- Development of new vitamins and study on their volume sufficiency for population

CENTRAL BOTANICAL GARDEN

Akademicheskaya St., 27
220072 Minsk
Republic of Belarus
Fax 0037517 2841853

- Selection and search of plants species for introducing in Belarus or foreign states

THE BIOLOGY DEPARTMENT

Skariny Ave., 66
220072 Minsk
Republic of Belarus
Fax 0037517 2842821
biology@presidium.bas-net.by

- Biological diversity, ecology problems
- Biochemistry mechanisms in flora and fauna
- Physics and chemistry basics of biosystems