

Organizing Committee of the Seventh International Youth Scientific Conference "Physics. Technology. Innovation. FTI-2020", which was held from May 18 to May 22, 2020 on the basis of the Physico-Technical Institute of the Ural Federal University named after the first President of Russia B.N. Yeltsin" confirms that the reports of the following participants are recognized as winners.

### Online reports

#### Section 1. Nuclear and radiation technologies

<i>Maria Soldatova</i>	<i>SEPARATION OF URANIUM AND ZIRCONIUM IN "CHLORIDE MELT – GA–ZN EUTECTIC ALLOY"</i>
<i>Marina Romanova</i>	<i>MEASUREMENTS OF THE NEUTRON RADIATION SPECTRUM AT A NUCLEAR RESEARCH FACILITY</i>
<i>Konstantin Kostromin</i>	<i>EVAPORATION OF NITRIC ACID SOLUTIONS. FORMALINE DENITRATION IN A NATURAL-CIRCULATION EVAPORATOR WITH</i>
<i>Hamdy Awad</i>	<i>RADIOLOGICAL HAZARDS BY GEOCHEMICAL ANALYSIS ON THE GRANITIC ROCKS, UM TAGHER AREA, CENTRAL EASTERN DESERT, EGYPT</i>
<i>Alexey Calabourdin</i>	<i>NPP SAFETY. RISK ASSESSMENT USING FUZZY LOGIC METHODS</i>

#### Section 2. Condensed matter physics

<i>Ilya Petrenyov</i>	<i>CONDUCTANCE OF MEMRISTOR STRUCTURES BASED ON NANOTUBULAR ZIRCONIUM DIOXIDE</i>
<i>Ekaterina Dengina</i>	<i>TEMPERATURE FEATURES OF HYSTERESIS PROPERTIES OF LA-CO FILMS</i>
<i>Elena Trofimova</i>	<i>PHOTON CUTTING AND ENERGY TRANSFER PROCESSES IN <math>\text{Ca}_9\text{TB}(\text{PO}_4)_7</math> DOPED WITH <math>\text{Eu}^{3+}</math> IONS</i>
<i>Elvira Osanova</i>	<i>DYNAMIC SIMULATION OF BINDING AND DIFFUSION OF HELIUM IN CALCIUM, STRONTIUM AND BARIUM FLUORIDES</i>
<i>Anastasia Rusalina</i>	<i>INFLUENCE OF TI SPACER ON THE INTERLAYER EXCHANGE COUPLING IN <math>(\text{Dy-Co})/(\text{Fe-Ni})</math> FILM STRUCTURES</i>
<i>Natalia Toporova</i>	<i>MAGNETIC HARDNESS OF IRON-CONTAINING TANTALUM DICHALCOGENIDES</i>
<i>Yulia Khatchenko</i>	<i>STUDY OF THE ELECTRONIC STRUCTURE OF THE TOPOLOGICAL INSULATOR <math>\text{Bi}_{1-x}\text{Sb}_x\text{Te}_2</math></i>
<i>Sergey Savchenko</i>	<i>THERMALLY STIMULATED LUMINESCENCE OF UV IRRADIATED <math>\text{InP/ZnS}</math> QUANTUM DOTS</i>
<i>Anna Bondarevskaya</i>	<i>INFLUENCE OF CHROMIUM IMPURITY ON THE ELASTIC PROPERTIES OF CALCIUM FLUORITE</i>
<i>Anna Chlenova</i>	<i>MAGNETIC PROPERTIES AND GIANT MAGNETOIMPEDANCE OF THE FESIB FERROMAGNETIC ALLOY ELEMENTS</i>
<i>Ivan Yasyulevich</i>	<i>CORRELATION BETWEEN SPIN AND CHARGE KINETICS IN HELICAL MAGNETS</i>
<i>Ilya Iakovlev</i>	<i>FIELD-DEPENDENT THERMODYNAMIC MEASUREMENTS OF THE SPIN LIQUID CANDIDATE <math>\text{YBMgGaO}_4</math></i>
<i>Evgeny Greshnyakov</i>	<i>THE MORPHOLOGY OF CHARGED DOMAIN WALLS IN LITHIUM TANTALATE WITH COMPOSITIONAL GRADIENTS</i>
<i>Anastasiya Kokorina</i>	<i>QUANTUM TRANSMITTER ENGINEERING BASED ON TRANSITION METAL ADATOMS</i>
<i>Pavel Russkikh</i>	<i>A CONDUCTOR WITH SPACE-VARIABLE RESISTIVITY UNDER HIGH PULSED MAGNETIC FIELD</i>
<i>Timofey Losev</i>	<i>ELECTRONIC AND OPTIC PROPERTIES OF <math>\text{SNO-2:Eu}</math></i>
<i>Ekaterina Vorontsova</i>	<i>PREPARATION AND STUDY OF FILMS FROM <math>\text{Ag}_2\text{S}</math> NANOPARTICLES STABILIZED BY MPS</i>
<i>Sviatoslav Kiselev</i>	<i>LUMINESCENCE STUDY OF <math>\text{KLuPO}_7</math> DOPED WITH <math>\text{Pr}^{3+}</math> IONS UNDER DIFFERENT TYPES OF EXCITATION</i>

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Vadim Nosovets	STRUCTURAL FEATURES AND PHYSICAL PROPERTIES OF LAYERED COMPOUNDS FE <sub>3</sub> Ti <sub>4</sub> (SY,SE1-Y) <sub>8</sub>
Viktoria Maltseva	INTERGRAIN EXCHANGE INTERACTION OF PR-FE-B SYSTEM COMPOSITE NANOCRYSTALLINE ALLOYS
Artem Shilov	OPTICAL PROPERTIES OF HAFNIA THIN FILMS NEAR ABSORPTION EDGE
Anna Pankratova	THE GROUND-STATE MAGNETIC PHASE DIAGRAM OF METALS AND MAGNETIC SEMICONDUCTORS WITHIN THE S-D MODEL
Egor Tsuvarev	THERMODYNAMIC AND MAGNETIC PROPERTIES OF ONE-DIMENSIONAL DECORATED CHAIN IN ISING MODEL
Sabina Emelyanova	THE EFFECT OF THERMOBARIC TREATMENT ON THE MAGNETOCALORIC EFFECT IN ALLOYS BASED ON NI-MN-IN
Vadim Foshin	THE EFFECT OF HEAT TREATMENT ON ELECTRICAL PROPERTIES OF THE MULTILAYER STRUCTURE [ZNO/C] <sub>25</sub>
Kristina Trofimova	OPTICAL AND ELECTROPHYSICAL PROPERTIES OF COMPOUNDS BASED ON INDOLOCARBASOL

### Section 3. Instrument making and robotics

Artur Serazetdinov	PARAMETRIC LAYOUT CELL DESIGN OF N-MOS TRANSISTOR WITH ENHANCED RADIATION HARDENED PROPERTIES
Ekaterina Krasnoborova	VIRTUAL INSTRUMENT OF LASER STIMULATION CONTROL FOR MEASURING CURRENT-VOLTAGE CHARACTERISTICS OF MATERIAL
Nikita Komarov	3D RECONSTRUCTION FOR THE PROTOTYPE OF A CT SCANNER WITH A PULSED X-RAY SOURCE
Vitaly Patrakov	HIGH VOLTAGE RESONANT TRANSFORMER WITH INVERTER POWER SUPPLY
Pavel Mikhailov	DESIGN OF MICRO PULSED PLASMA THRUSTER
Nikolay Martemyanov	OPTICAL STIMULATION MODULE OF WIDEGAP MATERIALS FOR MICROPROBE PLATFORM
Ivan Pronichev	ANALYSIS OF THE PLANAR TRAJECTORY OF HUMAN MOVEMENT TO CONFIGURE THE ROBOT CONTROL SYSTEM
Alexander Pirogov	THE DEVELOPMENT OF DYNAMICALLY RECONFIGURABLE DEVICES OF DIGITAL SIGNAL PROCESSING BASED ON FIELD-PROGRAMMABLE GATE ARRAY (FPGA)
Vasily Ostrovsky	DEVELOPMENT OF A HARDWARE-SOFTWARE COMPLEX FOR STUDYING OWN ELECTROMAGNETIC RADIATION DURING FREEZING OF WATER
Sofya Briginets	PAIRING A PORTABLE HEART MONITOR WITH MOBILE DEVICES

### Section 4. Chemical technology

Egor Gordeev	STUDY OF EFFECT OF HYDROTHERMAL TREATMENT OF YTTRIUM-EUROPIUM HYDROXONITRATE ON THE LUMINESCENT PROPERTIES OF OXIDE SYSTEMS
Polina Solodovnikova	METHOD FOR SYNTHESIS OF COMPOSITION BASED ON ALUMINIUM OXIDE AND SOLID SOLUTION OF CERIUM AND ZIRCONIUM OXIDES
Evgeniy Baksheev	INVESTIGATION OF THE BARIUM EFFECT ON BEHAVIOUR OF THE OSC-MATERIAL IN THE COMPOSITION OF THREE-WAY CATALYSTS
Anna Vagina	DEVELOPMENT OF SCANDIUM OXIDE REFERENCE MATERIALS BY HIGH-TEMPERATURE MELTING WITH LITHIUM-BORATE FLUX
Nadezhda Belokonova	DEVELOPMENT OF THE 90SR CONCENTRATION STAGE FROM SAMPLES OF WEAKLY MINERALIZED WATER USING THE INORGANIC SORBENT THERMOXID-3K
Kirill Shestakov	RESEARCH OF THE INFLUENCE HYDROTHERMAL TREATMENT ON LEACHING REE OF PHOSPHOGYPSUM
Elizaveta Pankrushina	RAMAN HYPERMAPPING OF HUMAN TEETH: ANALYSIS AND STATISTICAL APPROACHES

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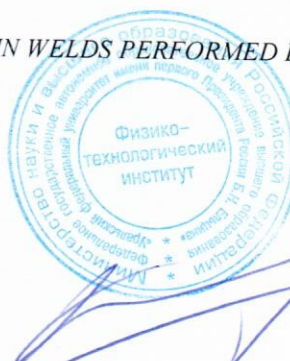


Sergey Silenkov Dmitry Eltsov	PERMITTIVITY DETERMINATION IN NANOTUBULAR TITANIA THEORETICAL STUDY OF THE POSSIBILITY OF ELECTROTHERMAL MOLECULAR ABSORPTION DETERMINATION OF IODINE
Anna Kasyanova	A COMPARATIVE ANALYSIS OF MASS-BIAS CORRECTION METHODS FOR SR ISOTOPE RATIO DETERMINATION BY MC-ICP-MS
Ekaterina Melnik	STUDY OF CONDITIONS OF COMPLEXING DITHIOOXAMIDE COMPLEX OF PALLADIUM (II) IN SURFACTANT SOLUTION
Viktoria Gushshamova	SIMULATION OF VELOCITIES IN HEAT EXCHANGE TUBES USING THE THERMOSYPHON DISTRIBUTOR
Regina Zaidullina	FUNCTIONALIZATION OF THE PLATINUM ELECTRODE BY THE METHOD OF OXIDATIVE ELECTROGRAFTING OF AMINOBENZOIC ACIDS
Daria Timina	INVESTIGATION OF ANTIOXIDANT CAPACITY OF SUBSTANCES OF DIFFERENT HYDROPHILICITY IN THE COMPOSITION OF VITAMIN PREPARATIONS
Viktoriya Igoshcheva	INVESTIGATION OF EFFECT OF MAGNESIUM NITRATE FOR ELECTROTHERMAL ATOMIC ABSORPTION DETERMINATION OF ALUMINUM, SILVER, CHROMIUM, COPPER AND TIN
Dmitrii Liubichev	NOVEL APPROACHES FOR SEPARATION AZEOTROPIC MIXTURES USING DEEP EUTECTIC SOLVENTS
Anton Buzlukov Maria Berseneva Daniil Lobanov	MODERNIZATION OF GAS SEPARATORS OF INSTALLATION OF COMPLEX GAS PREPARATION STUDY OF THE INTEGRATED PROCESSING OF LITHIUM-ION BATTERIES EAF AND LF SLAG CO-PROCESSING: STUDY FOR WASTELESS UTILIZATION

#### Section 5. Material science

Yulia Kurasova	INFLUENCE OF PRECIPITATION PARAMETERS ON GRANULOMETRIC COMPOSITION AND SHAPE OF CHROMIUM HYDROXIDE AND OXIDE PARTICLES
Dina Markovskaya	NEW MATERIALS BASED ON CDS AND ZNS FOR PHOTOCATALYTIC HYDROGEN EVOLUTION AND CONVERSION OF VISIBLE LIGHT ENERGY TO ELECTRICITY
Il'sur Zakirov Danil Davydov	PRODUCTION OF COMPOSITE COATINGS BASED ON ZIRCONIUM DIOXIDE ELECTROSTATIC PROPERTIES OF THE HALLOYSITE NANOTUBULAR MINERAL SURFACE BY EPR SPECTROSCOPY OF PH-SENSITIVE NITROXIDE RADICALS
Ivan Kuziv	STUDYING THE INFLUENCE OF CAVITATION AND ULTRASOUND ON A TITANIUM ALLOY BY POSITRON ANNIHILATION SPECTROSCOPY METHOD
Alexander Varaksin Mark Erofeev	PRODUCING METHOD OF HIGH ENTROPY CARBIDES OF TRANSITION METALS INVESTIGATION OF THE LOW DIMENTIONAL NANOCARBON MATERIALS SYNTHESISED BY ION-PLASMA TECHNOLOGY
Anastasia Kasilyunas Khristova Maria Alexander Korenev	FEATURES OF THE SELECTION OF HIGH-PURITY MATERIALS ELECTRICAL PROPERTIES OF SAMPLES BASED ON AL-DOPED BARIUM INDATATE EVOLUTION OF STRUCTURE AND PROPERTIES IN BIOCOMPATIBLE ALLOYS TI-39NB-5ZR, TI-39NB-5ZR-2SN, TI-39NB-5ZR-2SN-2TA UNDER DEFORMATION AND THERMAL EFFECTS
Regina Kamalova Ekaterina Ulyanova	THE STUDY OF THE ELECTRET PROPERTIES OF POLYLACTIDE AND MINERAL FILLERS IMMOBILIZATION OF CDS COLLOIDAL NANOPARTICLES IN ANATAZ / BROOKITE MATRIX VIA SOL-GEL METHOD: HREM, RAMAN -SPECTROSCOPY, MD MODELING
Nikolai Nikulchenkov Maria Bazueva	SOLID-STATE AMORPHIZATION IN THE FE-SI-CU-MG-O SYSTEM PHYSICAL AND CHEMICAL PROPERTIES OF PEROVSKITE-LIKE COMPOUNDS OF THE COMPOSITION PR-BA-FE-CO-O
Danil Novgorodov	METALLOGRAPHIC EXAMINATION OF DEFECTS IN WELDS PERFORMED BY BUTT WELDING

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### Section 6. Information systems and technologies

<i>Daria Rusova</i>	<i>MODELING DENDRITIC STRUCTURES ON A WATER SURFACE</i>
<i>Ilya Balyakin</i>	<i>MOLECULAR DYNAMICS OF HIGH ENTROPY ALLOYS USING ARTIFICIAL NEURAL NETWORKS</i>
<i>Igor Kraglik</i>	<i>STAR VM VIRTUAL MACHINE</i>
<i>Dastan Seitov</i>	<i>THE INTERPARTICLE POTENTIALS FOR MOLECULAR DYNAMIC SIMULATION OF THE IMPACT OF COLLISION CASCADES ON GAS BUBBLES IN PLUTONIUM DIOXIDE</i>
<i>Aleksey Belousov</i>	<i>THE USE OF THE URAN SUPERCOMPUTER AND OPENMP TECHNOLOGY FOR CALCULATING CONTROLLABILITY SETS OF DYNAMIC SYSTEMS</i>
<i>Nikita Kuntsevich</i>	<i>MODELING OF THE CORE STRUCTURE BY PACKING OF THE SPHERES-POLYHEDRA: INFLUENCE OF THE DILATATION AT THE POROSITY</i>
<i>Ekaterina Abramova</i>	<i>STOCHASTIC DESTRUCTION OF THE OSCILLATORY REGIME OF COEXISTENCE OF POPULATIONS IN THE «PREDATOR-TWO PREY» MODEL</i>
<i>Yuliya Gushchina</i>	<i>DEVELOPMENT OF SOFTWARE FOR DETECTING UNAUTHORIZED TRAFFIC</i>
<i>Alexander Belyaev</i>	<i>REGULAR AND CHAOTIC REGIMES IN THE SYSTEM OF COUPLED POPULATIONS</i>
<i>Andrey Sheka</i>	<i>CALCULATION OF HEAD ROTATION ANGLES USING SELECTIVE SUBSETS OF FACIAL KEYPOINTS</i>
<i>Dmitry Rotman</i>	<i>CALCULATION OF THE RADIATION LOSS PROFILE AND THE INTEGRAL RADIATION POWER OF THE PLASMA CORD BASED ON AXUV-BOLOMETER DATA</i>

### Section 7. Bioengineering and biotechnology

<i>Maria Ishkova</i>	<i>A STUDY OF QUALITY INDICATORS OF YOGURT PREPARED IN CONTAINERS PRE-TREATED WITH IONIZING RADIATION</i>
<i>Valentina Kasyanova</i>	<i>MODELING OF CERIUM OXIDE NANOPARTICLES PHARMACOKINETICS</i>
<i>Aleksandra Myshkina</i>	<i>THE USE OF CERIUM DIOXIDE NANOPARTICLES AS A PHOTOCATALYST</i>
<i>Ekaterina Kostina</i>	<i>Radiation methods of potato processing</i>
<i>Olga Korotovskikh</i>	<i>USE OF LOW DOSES OF IONIZING RADIATION FOR GROWTH AND STIMULATION ON THE EXAMPLE OF SACCHAROMYCES CEREVISIAE</i>
<i>Anastasia Chumanova</i>	<i>ANTIBACTERIAL EFFECT OF CARBON AND SILVER COATINGS</i>
<i>Anna Naumova</i>	<i>INVESTIGATION OF THE EFFECT OF CERIUM DIOXIDE NANOPARTICLES ON THE RADIOSENSITIVITY OF MACROPHAGES</i>
<i>Artem Grivkov</i>	<i>APPLICATION OF CONVOLUTIONAL NEURAL NETWORKS FOR DIAGNOSTICS OF TUBERCULOSIS</i>
<i>Denis Volzhaninov</i>	<i>MATERIALS AND METHODS FOR BIOMECHANICAL EXPERIMENTS ON SINGLE CARDIOMYOCYTES</i>
<i>Arthur Serazetdinov</i>	<i>X-RAY IMAGE SEGMENTATION WITH THE USE OF MACHINE LEARNING ALGORITHMS</i>
<i>Alexey Shchelkanov</i>	<i>INVESTIGATION OF CHEMICAL COMPOSITION OF AEROSOL IN THE SURFACE AIR OF THE MIDDLE URALS</i>
<i>Tatiana Myachina</i>	<i>THE USE OF FLUORESCENT DYES TO STUDY THE EFFECTS OF PATHOLOGICAL CONDITIONS ON THE ELECTROMECHANICAL COUPLING IN CARDIOMYOCYTES</i>
<i>Elvira Denisova</i>	<i>RADIOACTIVE PARTICLES TRANSPORT AND ABSORBED DOSES DISTRIBUTION IN THE RATS' GASTROINTESTINAL TRACT</i>
<i>Anatolii Mulin</i>	<i>IDENTIFICATION OF OVERTRAINING AND A SYSTEM FOR RESTORING ATHLETES' PERFORMANCE IN HOCKEY PRACTICE</i>
<i>Ilya Izmozherov</i>	<i>AN AUTOMATED CLASSIFIER AND COUNTER FOR MICROBIOLOGICAL OBJECTS</i>
<i>Elizaveta Politova</i>	<i>METHODS FOR STUDYING MYOCARDIAL FUNCTION AT THE MOLECULAR AND CELLULAR LEVELS IN NORM AND PATHOLOGY</i>
<i>Maria Kiseleva</i>	<i>INVESTIGATION OF ANTIBACTERIAL AND PHOTOCATALYTIC PROPERTIES OF ALUMINUM OXIDE PARTIALLY COATED WITH SILVER</i>
<i>Vladimir Sholokhov</i>	<i>ELECTROMECHANICAL MODEL OF THE LEFT VENTRICLE OF THE HUMAN HEART</i>

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**Section 8. Innovation and social technology**

<i>Alena Molodnyakova</i>	<i>DEVELOPMENT OF ENGINEERING THINKING OF PRESCHOOL CHILDREN THROUGH INNOVATIVE 3D-MODELING TECHNOLOGY IN LIGROGAME</i>
<i>Evgeniya Chikova</i>	<i>THE DEVELOPMENT OF ACCESSIBLE URBAN ENVIRONMENT USING THE PROJECT «MOBILE APPLICATION "CITY WITHOUT LIMITS"» AS AN EXAMPLE</i>
<i>Ekaterina Adiyak</i>	<i>DEVELOPMENT OF A TECHNIQUE FOR IDENTIFYING THE ECONOMIC AGENT BELONGING TO THE LOCAL COMMUNITY BY EXPERIMENTAL DATA IN THE B2B SEGMENT</i>
<i>Olga Glebova</i>	<i>ANALYSIS OF INDICATORS OF PUBLICATION ACTIVITY IN ORDER TO CREATE A SYSTEM OF SUCCESSFUL IMPLEMENTATION OF SCIENTIFIC PUBLICATION</i>
<i>Alina Dukki</i>	<i>BUSINESS MODEL OF DEVELOPMENT OF THE ORGANIZATION ON THE BASIS OF OPEN INNOVATIONS</i>
<i>Ksenia Romanycheva</i>	<i>TYPICAL RISKS AND CAPABILITIES OF THE MEASUREMENT VERIFICATION PROCESS</i>

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