

Organizing Committee of the Ninth International Youth Scientific Conference “Physics. Technology. Innovation. PTI-2022”, which was held from May 15 to May 19, 2023 on the basis of the Institute of Physics and Technology 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**.

### **Section 1. Nuclear and radiation technologies**

#### **Oral reports**

1. DEVELOPMENT OF AN ION SOURCE FOR AN INERTIAL ELECTROSTATIC PLASMA CONFINEMENT CHAMBER, *Igor Il'ichev*.
2. FIRST-PRINCIPLE STUDY OF THE TRITIUM BEHAVIOR IN A FLIBE MOLTEN SALT MIXTURE, *Andrei Anisimov*.

#### **Poster Session**

1. DESIGN OF NEUTRON GUIDE FOR A REFLECTOMETER ON COMPACT NEUTRON SOURCE DARIA, *Popov Artem*.
2. RADIOECOLOGICAL MONITORING OF YEKATERINBURG SOILS, *Sultanova Yliana*.
3. RADIATION RISKS ASSESSMENT IN TERRITORIES WITH INCREASED CONTENT OF TECHNOGENIC RADIONUCLIDES, *Zigangirov Arthur*.

### **Section 2. Condensed matter physics**



#### **Oral reports**

1. THERMAL STABILITY OF QUANTUM CONDUCTIVE FILAMENTS IN NANOTUBULAR ZIRCONIA, *Petrenyov Ilya*.
2. COMPUTER SIMULATION OF THE STRUCTURE AND PHYSICOCHEMICAL PROPERTIES OF AL-CU ALLOYS USING INTERPARTICLE POTENTIALS BASED ON NEURAL NETWORKS, *Hazieva Ekaterina*.
3. PLASMON SILVER NANOPARTICLES IN MGAL<sub>2</sub>O<sub>4</sub> SPINEL AND SiO<sub>2</sub>, *Vagapov Alexander*.

#### **Poster Session**

1. PREDICTION OF MAGNETOTRANSPORT PROPERTIES OF SUPERLATTICES BASED ON MACHINE LEARNING METHODS, *Naydanov Ivan*.
2. SPECTRALLY RESOLVED THERMOLUMINESCENCE OF HAFNIA NANOTUBES IN LNT – 623 K RANGE, *Shilov Artem*.
3. EVALUATION OF THE ACCURACY AND COMPUTATIONAL SPEED FOR THE METHOD OF MOLECULAR DYNAMICS WITH MACHINE LEARNING POTENTIAL FOR CARBON STRUCTURES, *Arslanov Kirill*.
4. PHOTOLUMINESCENT PROPERTIES THERMOPOLYMERIZED STRUCTURES G-C<sub>3</sub>N<sub>4</sub>, *Martemyanov Nikolay*.
5. THE ANOMALIES OF ELECTRONIC HEAT CAPACITY DURING PHASE TRANSITION IN CHIRAL FERROMAGNET MNSI, *Chernikova Maria*.
6. INFLUENCE OF ANNEALING TEMPERATURE ON THE PHASE COMPOSITION OF A-FE<sub>2</sub>O<sub>3</sub> THIN FILMS, *Merencova Kristina*.
7. EXCHANGE BIAS EFFECT IN FERRIMAGNETIC COMPOUND FE<sub>2</sub>CRSE<sub>4</sub>, *Komarova Valeria*.

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8. FEATURES OF THERMOLUMINESCENCE KINETICS OF ZRO<sub>2</sub> CERAMICS SYNTHESIZED BY ELECTRON BEAM METHOD, *Kasatkina Yana*.
9. PROTON MIGRATION ON A TWO-DIMENSIONAL BCN LAYER SURFACE, *Shkodin Alexandr*.
10. MAGNETIC AND ELECTRICAL PROPERTIES, STRUCTURE AND HARDNESS OF GP1 STAINLESS-STEEL SAMPLES MANUFACTURED ON A LASER 3D PRINTER, *Gordeev Nikita*.

### Section 3. Instrument making and robotics

#### Oral reports

1. VIRTUAL INSTRUMENT DEVELOPMENT FOR STUDYING MEMRISTIVE STRUCTURES IN THE PULSE MODE, *Fedorov Danil*.
2. UNIVERSAL COMPLEX FOR DIGITAL GENERATION AND ANALYSIS OF MAGNETIC FIELD WITH ARBITRARY TIME DEPENDENCE, *Ungvitskii Gleb*.

#### Poster Session

1. EXPERIMENTAL INVESTIGATION OF PICOSECOND PULSE DISPERSION IN MICROSTRIP TRANSMISSION LINES, *Patrakov Vitaly*.
2. A DAQ-SYSTEM OF THERMOCOUPLE CALORIMETER, *Mamonov Anton*.

### Section 4. Chemical technology

#### Oral reports

1. PHYSICAL AND CHEMICAL CHARACTERISTICS OF SOLID RADIOACTIVE WASTES FROM A NEAR-SURFACE STORAGE FACILITY OF URANIUM CONVERSION PRODUCTION, *Nalivaiko Ksenia*.
2. DETERMINATION OF V, AS, FE, CL AND OTHER COMPONENTS IN VANADIUM CATALYSTS BY XRF, *Shikhaleeva Marina*.
3. DEVELOPMENT OF A TECHNIQUE FOR THE ANALYSIS OF A FUEL COMPOSITION BASED ON LITHIUM, SODIUM AND POTASSIUM FLUORIDES, *Grubtsova Karina*.
4. DEVELOPMENT OF A METHOD TO DETERMINE SR-90 IN NATURAL WATERS WITH A LOW DETECTION LIMIT, *Belokonova Nadezhda*.

#### Poster Session

1. DETERMINATION OF RARE EARTH ELEMENTS IN PUROLITE C160 RESIN BY WD-XRF, *Ulanova Olesya*.
2. DETERMINATION OF ALPHA EMITTING RADIONUCLIDES IN SAMPLES OF SOLID RADIOACTIVE WASTE, *Fomin Andrey*.
3. HYDROFLUORIDE PROCESSING OF INDUSTRIAL WASTE TO OBTAIN FUNCTIONAL MATERIALS, *Medyankina Irina*.
4. INVESTIGATION THE EFFECT OF YTTRIUM ADDITIVE ON THE PRECIPITATION OF ZIRCONIUM HYDROXIDE DURING CONTROLLED TWO-JET DEPOSITION, *Domashenkov Maksim*.
5. OPTIMISATION OF EXTRACTION METHODS OF CHLORELLA GROWTH FACTOR FROM CHLORELLA VULGARIS AS A POTENTIAL NANOPARTICLE MATERIAL, *Bulya Torkwase Emmanuella*.

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6. EXTRACTION OF URANIUM FROM SULFURIC ACID SOLUTIONS OF LEACHING OF CONVERSION PRODUCTION WASTES, Nechkin Michael.
7. DETERMINATION OF BIOMARKERS BY THE "FINGERPRINTS" METHOD IN VOLCANIC OIL BY THE GC-MS METHOD, Belonosova Viktoria.
8. ION EXCHANGE OF LAYERED REE HYDROXIDES IN CARBONATE SOLUTIONS, Kosykh Anastasiya.

### Section 5. Material science

#### Oral reports

1. PHYSICO-CHEMICAL PROPERTIES OF LANTHANUM COMPOUNDS AS CATHODE MATERIALS FOR SOLID OXIDE FUEL CELLS, Guseva Ekaterina.
2. CATALYSTS BASED ON G-C<sub>3</sub>N<sub>4</sub> FOR PHOTOCATALYTIC HYDROGEN PRODUCTION UNDER VISIBLE LIGHT, Potapenko Ksenia.
3. PREDICTING THE PROPERTIES OF HIGH-ENTROPY CARBIDES WITH THE INTERATOMIC POTENTIAL BASED ON NEURAL NETWORKS, Pikalova Nadezhda.

#### Poster Session

1. STUDY OF THE INTERNAL STRUCTURE AND MAGNETIC PROPERTIES OF NANOPARTICLES BASED ON FEME@C (ME=CO,NI) BINARY ALLOYS BY NMR, Suvorkova Yekaterina.
2. DEVELOPMENT OF SRFE12O19 AND BAFE12O19 OXYGEN ACCUMULATORS FOR CHEMICAL CYCLING TECHNOLOGY, Ryzhov Dmitriy.
3. PHYSICO-CHEMICAL PROPERTIES OF A COMPLEX OXIDE PR<sub>1.6</sub>CA<sub>0.4</sub>NI<sub>1</sub>-YCUYO<sub>4</sub> AS A CATHODE MATERIAL FOR MEDIUM-TEMPERATURE SOFC, Zhulanova Tatiana.
4. IONIC CONDUCTIVITY IN BA- AND SR-SUBSTITUTED LAYERED PEROVSKITE BASED ON BALA<sub>2</sub>IN<sub>2</sub>O<sub>7</sub>, Fedorova Irina.
5. SPECTRAL AND LUMINESCENT PROPERTIES OF NAY<sub>1</sub>-XTMXGEO<sub>4</sub> IN IR RANGE, Melentsova Anna.

### Section 6. Information systems and technologies

#### Oral reports

1. ANALYSIS OF METHODS FOR CALCULATING THE RESISTANCE OF A PERFORATED SURFACE, Revyakina Polina.

#### Poster Session

1. DEVELOPMENT OF A PROTOTYPE MODEL OF BLOOD FLOW IN THE LIVER, Askarova Elizaveta.
2. NUMERICAL SCHEME FOR FAST CALCULATION OF STRUCTURAL COMPLEXITY, Solomein Andrey.

### Section 7. Bioengineering and biotechnology

#### Oral reports

1. FLUORESCENT BIOSENSOR FOR THE REGISTRATION OF ORGANOPHOSPHORUS COMPOUNDS, Izmozherova Kira.

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2. FABRICATION OF FUCOIDAN/CHITOSAN NANOPARTICLES FOR THE CONTROLLED RELEASE OF PIPERINE IN VITRO, *Mensah Emmanuel Ofosu*.
3. CHEST X-RAY BONE SUPPRESSION VIA MACHINE LEARNING METHODS, *Chechulina Maria*.

### Poster Session

1. ANTIBACTERIAL ACTIVITY OF CARBON-CONTAINING COATINGS, *Lapina Polina*.
2. OPTIMIZATION OF DISTANT RADIOTHERAPY PLANNING BY THE GEUD FUNCTION, *Vechtomova Anastasia*.
3. DEVELOPMENT OF A FUNCTIONAL PRODUCT FOR PREVENTIVE NUTRITION OF MINERS, *Chernoguzova Diana*.
4. THE EFFECT OF IONIZING RADIATION ON THE POTATO AND CORN STARCH, *Krylova Darya*.
5. THE EFFECT OF LOW-ENERGY ELECTRON BEAM TREATMENT ON THE PROPERTIES OF STARCH AND REDUCING SUGARS OF WHEAT, *Pustotina Alexandra*.

### Section 8. Innovation and social technology

#### Oral reports

1. ASSESSMENT OF THE ORGANIZATION'S INNOVATION ACTIVITY BASED ON INTERNATIONAL STANDARDS, *Domanova Maria*.
2. PATENT AND INNOVATION ACTIVITY IN RUSSIA: NUMBERS AND PROBLEMS, *Pavlov Egor*.
3. MODEL OF INNOVATIVE PROCESSES IN LOGISTIZATION, *Davletova Elizaveta*.
4. METHODOLOGY FOR ASSESSING PROJECT MATURITY AS A CONTINUOUS PROCESS OF ORGANIZATION IMPROVEMENT, *Khokhlov Dmitrii*.
5. FORMING CONDITIONS FOR DIGITAL TRANSFORMATION OF AGRICULTURE, *Meshkova Arina*.

### Section 9. Young talents (section of schoolchildren)

#### Poster Session

1. INFLUENCE OF THE SYNTHESIS PARAMETERS OF THE ALUMINUM OXIDE SYNTHESIS ON ITS VISCOSITY IN THE WORKING SUSPENSION, *Daria Vostretsova*.
2. THE INFLUENCE OF THE ALUMINUM OXIDE SYNTHESIS PARAMETERS ON ITS SPECIFIC SURFACE, *Daria Mogilnikova*.
3. CERTIFICATION OF THE MINES OF THE SHAITANSKY SECTION OF THE REZHEVSK NATURAL AND MINERALOGICAL RESERVE, *Yaroslav Semenishchev*.

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